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United States Department of Agriculture

Food and Nutrition Service

3101 Park Center Drive
Second Floor
Alexandria, VA 22302

The Feasibility of a Nationwide Electronic Benefit Transfer System for the Food Stamp Program

John A. Kirlin, Charles R. King, Elizabeth E. Davis, Christopher Jones, and Gary P. Silverstein

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Electronic Benefit Transfer System Demonstrations for the Food Stamp Program

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This report on the Feasibility of a Nationwide Electronic Benefit Transfer System for the Food Stamp Program originally was envisioned as two separate reports: one addressing the feasibility of a nationwide EBT system and the other examining issues involved in integrating EBT systems with commercial POS networks. As work on both reports progressed, it became clear that each report's subject matter overlapped significantly with the other. Abt Associates and FNS therefore agreed to the preparation of a single report containing all relevant information from the two draft reports.

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EXECUTIVE SUMMARY

In an effort to ensure the use of program benefits for intended purposes and to improve the general integrity, efficiency and accuracy of benefit issuance and redemption, the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture has been studying the feasibility of using electronic benefit transfer (EBT) systems to issue and redeem program benefits. These systems operate much like commercial debit card networks, using computer systems, point-of-sale (POS) terminals, and electronic funds transfers to deliver and redeem program benefits. An introduction of EBT systems into the Food Stamp Program would integrate benefit delivery with the commercial sector's increasing reliance on electronic payment systems.

At present the Food Stamp Program issues benefits in the form of paper food stamp coupons. Program recipients use these coupons to purchase eligible food items, and retailers deposit the coupons at their local banks for cash credit. The banks, in turn, receive credit for the coupons they accept when they send the coupons to a Federal Reserve Bank. The Federal Reserve is reimbursed from a program account at the U.S. Treasury.

The coupon-based issuance and redemption process is cumbersome to administer. Complex procedures are needed to prevent coupon losses and to track and reconcile the flow of benefits through the system. Even with these procedures, some losses occur. Furthermore, it is difficult to totally prevent coupons from becoming an underground currency, with recipients selling their coupons for cash at discounted values, (i.e., trafficking).

The use of coupons also imposes costs on program recipients, retailers and financial institutions. In many areas, recipients must make a special trip each month to obtain their coupons. If they lose their coupons after issuance, the benefits are not replaced. Retailers and financial institutions need to use special procedures to handle and process the coupons they accept.

By eliminating the use of food stamp coupons, an EBT system can improve program accountability and reduce the costs of program participation. Recipients would no longer need to make special trips to obtain their benefits, and problems with lost or stolen coupons or authorization documents would be eliminated. Instead, recipients would access their benefits at food

stores' POS terminals using a magnetic stripe debit card and a personal identification number (PIN)--which helps to prevent unauthorized use of a lost or stolen card. An EBT system also makes it difficult to convert program benefits into cash, and cash change at the store is eliminated altogether.

Retailers and financial institutions do not have to handle and process separate food stamp coupons in an EBT system. Instead, a store's POS terminal sends information about a desired EBT purchase to a central file over a telecommunications network. Once the purchase is authorized by the system, the purchase amount is debited from the recipient's account and credited to the retailer's system account. During system settlement, funds are electronically transferred from the Food Stamp Program's account at the U.S. Treasury to retailers' depository accounts.

Demonstrations of on-line EBT systems are underway in four States: Maryland, Minnesota, New Mexico, and Pennsylvania. The purpose of these demonstrations is to determine in a variety of conditions the technical feasibility of on-line EBT systems and their cost-effectiveness, as well as the impacts of EBT systems on program recipients, retailers, financial institutions, and levels of benefit loss and diversion. FNS is currently in the process of selecting a contractor to demonstrate an off-line EBT system: one that stores information about program benefits in the recipient's access card, eliminating the need for on-line authorization at the time of the purchase transaction.

REPORT PURPOSE

The EBT demonstrations and the perceived benefits of EBT systems have generated an increased interest in these systems among vendors, State and Federal Agencies, and the Congress. In response, FNS is examining the feasibility of a nationwide EBT system. Key issues include the expected costs to design, develop, implement and operate a nationwide EBT system; technical feasibility and system performance; and how Federal and State Agencies would administer a nationwide system. Another issue is how to integrate an EBT system with commercial credit and debit POS systems, making use of existing terminals, telecommunications networks, and processing software and hardware. The legislative and regulatory environment in which an EBT system would operate also must be considered. A final issue is what approach to take in

developing a nationwide EBT system. For instance, should a single, centralized system or multiple, regional systems be implemented, or should each State have its own separate system? If the latter, how much standardization in system design should be required?

This report offers a preliminary examination of the issues surrounding the feasibility of implementing a nationwide EBT system. In researching these issues, we have interviewed numerous Federal and State officials and representatives of the debit card industry. Further information on the feasibility of a nationwide EBT system has been gained from the EBT demonstrations being sponsored by FNS. Due to the presence of commercial POS networks which use on-line authorization technologies, the major focus of the report is on the feasibility of implementing a nationwide, on-line EBT system rather than an off-line system. The report also considers the implementation of a multiprogram EBT system--one that serves both the Food Stamp Program and cash assistance programs like Aid to Families with Dependent Children (AFDC).

ALTERNATIVE APPROACHES TO SYSTEM DEVELOPMENT

An on-line EBT system would operate very much like existing commercial, debit card networks--those that issue bank or retailers' proprietary cards that can be used at automated teller machines (ATMs). Given this similarity, it is both feasible and necessary that an EBT system be integrated with the existing networks, using commercial terminals and processing capabilities as much as possible. System costs would be much higher without integration, and retailers would probably resist a new food stamp payment system that could not be integrated with their existing systems.

Even within the context of system integration, alternative approaches exist for the development of a nationwide EBT system. Three basic alternatives have been identified and are referred to as the "Multiple Design" approach, the "Standardized Design" approach, and the "Unitary Design" approach. Each approach gives individual State Agencies the right to decide whether or not to participate in an EBT system. The approaches differ in terms of how much control States have over system design, whether responsibility for providing the processing infrastructure of an EBT system rests with State or Federal Agencies and their vendors, and the degree to which that processing infrastructure is centralized.

In the Multiple Design approach, Federal Agencies specify the functional requirements of an EBT system (i.e., what the EBT system must do), but State Agencies are responsible for designing, developing and implementing each State's system. It is anticipated that most State Agencies would contract with a vendor for these services. A nationwide EBT system in this approach would consist of numerous different systems, each operating independently of the others.

The Standardized Design approach is similar to the Multiple Design approach in that each State is still responsible for designing, developing and implementing its own EBT system. In the Standardized Design approach, however, Federal Agencies would specify some of the design parameters for the system as well as its functional requirements. One major reason for standardization is to allow recipients in one State to shop at stores in another State. The flow of EBT transaction information among the States' individual EBT systems is a process called "interchange," and it gives recipients the same flexibility in benefit use that they currently have under the coupon-based issuance and redemption system. Another advantage of standardizing the design of State systems is that integration of multiple State EBT systems with commercial POS systems is more feasible, which would allow greater sharing of POS terminals and communications lines.

The Unitary Design approach differs from the prior two approaches in that Federal Agencies would take the initiative to set up the basic processing infrastructure for a nationwide EBT system. In the centralized (or "National") version of a Unitary EBT system, Federal Agencies would select a single vendor who would set up a single EBT processing point, with communications lines established to each State. All EBT transactions would be transmitted to the single point for authorization. States deciding to establish an EBT system would tie into the National system, transmitting recipients' program issuance information to the central processing site.

A variant of the Unitary system is a decentralized (or "Regional") system, in which Federal Agencies would select multiple vendors to set up regional EBT processing sites. States would send issuance information to the vendor serving their area, and all transactions from the region would be sent to the vendor's processing site for authorization.

In any of the three approaches to system development, the EBT system could include cash assistance programs as well as the Food Stamp Program. If cash assistance programs were included, their recipients could withdraw cash benefits at POS terminals or ATMs.

Despite the differences among the three development approaches, they share a common relationship between the Federal government and the States. In providing system services, Federal and State Agencies and their vendors work together in a manner similar to existing relationships among financial institutions, network operators, and retailers within commercial POS networks.

FEASIBILITY OF A NATIONWIDE EBT SYSTEM

The implementation and operation of a nationwide, on-line EBT system is feasible under each of the three development approaches, although not all approaches are equally attractive. The following sections summarize the factors leading to this assessment of system feasibility.

Many State Agencies express positive interest in EBT systems, and about one-third of the States have taken concrete steps to investigate the feasibility of a local EBT system.

If a nationwide EBT system is to be implemented, individual State Agencies must support the concept and be willing to invest resources in system development and implementation. Based on interviews with program officials in 25 States, these officials gave numerous reasons for being interested in EBT systems. The reasons included improved public perception of the Food Stamp Program, improved service delivery to program recipients, reductions in benefit loss and program fraud, and perceived benefits to participating retailers and financial institutions. The officials also appeared more interested in multiprogram EBT systems than in a system which could serve only one benefit program.

About one-third of all States have taken steps to either plan for or implement an EBT system. These steps include participating in the current EBT demonstrations, preparing waiver requests for new demonstrations, issuing requests-for-information or requests-for-proposals from system vendors, and setting up EBT project teams.

State Agency concerns over EBT systems are largely financial.

State Agency administrators most frequently cited resource constraints as the biggest obstacle to implementation of EBT systems, including both State and Federal funding levels and lack of State personnel with appropriate technical or managerial skills. With respect to funding, administrators were concerned with high start-up costs and questions over the likely cost-effectiveness of EBT systems once they are operating. The latter concern was particularly important to States whose current issuance costs are relatively low.

Technical considerations favor the Standardized Design or Regional versions of a nationwide EBT system.

Regardless of which development approach is selected, a nationwide, on-line EBT system is technically feasible. The basic hardware, software and telecommunications networks needed for a nationwide system have been developed in the commercial sector and tested in several demonstrations. While some modifications to commercial software are needed to support an EBT system, these modifications are not extensive.

A major drawback to the Multiple Design approach to system development, however, is that it cannot fully support the interchange of benefits among individual State systems, a potentially severe limitation in those areas of the country where cross-border shopping by food stamp recipients is common. Some systems developed under the Multiple Design approach also might not be compatible with existing POS and ATM networks.

A National EBT system (i.e., the centralized version of the Unitary Design approach) also has some technical limitations. While a National system could be developed, the system would need to be very large and complex. If all food stamp and AFDC recipients participated in the National EBT system, the system's central database would need to hold nearly 8 million recipient account records and about 222,000 retailer account records. In addition, the system would need to be capable of handling an estimated peak volume of about 6 million financial and administrative transactions per day. A system of this size would require very specialized software and backup capabilities to avoid degradation in system reliability and transaction response times.

If Regional EBT systems were implemented instead of a National system, each regional processing site would require a much smaller database and would process fewer transactions. System size would be more in line with existing POS networks, and system operations would be simpler. Furthermore, it would be easier to integrate EBT operations with commercial processing centers. System performance, as measured by response times at the checkout lane and system availability, also would be improved. For these reasons the implementation of multiple regional systems is preferred on technical grounds to the establishment of a National system using one processing site.

There is little in the way of technical reasons to prefer either the Standardized Design or Regional EBT system approach over the other. If Federal Agencies specified appropriate design standards in either approach, the resulting EBT systems could support interchange and be compatible with commercial POS and ATM networks.

The above assessment of technical feasibility pertains only to on-line EBT systems. Off-line systems have not developed to the point where the technical feasibility of a nationwide, off-line EBT system can be assessed. In addition, a national infrastructure supporting off-line POS systems is not in place.

Regardless of development approach, a nationwide, on-line EBT system will be costly to develop and implement.

A significant obstacle to implementation of a nationwide EBT system is the projected cost of system design, development and implementation. The estimated cost of a joint Food Stamp/AFDC EBT system ranges from $233 to $291 million. The Multiple Design and Standardized Design approaches are the most expensive--estimated costs are $246 to $291 million. A Regional system would cost from $241 to $286 million, and the National system would cost between $233 to $278 million. The variation in costs within each development approach arises from different assumptions about the costs to deploy a POS terminal and whether PINs are assigned by the vendor or selected by recipients during training. PIN selection is more expensive than PIN assignment. Presently, both approaches are used in the commercial sector.

A significant component of total design, development and implementation costs is terminal installation, which is estimated to cost between $142

and $174 million nationwide. This cost does not include the purchase price of terminals; all system hardware costs are amortized and treated as a monthly operating expense. Estimated terminal installation costs assume that the EBT systems would be integrated with existing commercial systems, making use of about 50,000 commercially deployed POS terminals. While only 20,000 commercial POS terminals are deployed in food stores at present, 50,000 terminals will be deployed in five years if an annual growth rate of about 20 percent can be maintained. Recent trends and industry projections suggest that this should be possible.

The cost estimates also assume that an EBT system vendor will be able to modify existing POS software, thereby avoiding substantial software development costs. Similarities in POS and EBT system application software make this possible.

Finally, the above cost estimates assume that terminals would be deployed in all lanes of all program-authorized stores. If alternatives to equipping all lanes were determined to be feasible, implementation costs would be reduced. To illustrate, a 10-percent reduction in deployed terminals would reduce implementation costs by $13 to $16 million.

In addition to high initial design, development and implementation costs, a nationwide EBT system is likely to cost more to operate than present coupon issuance systems.

FNS and State Agencies spend an average of approximately $3.00 per food stamp case each month to administer the current coupon issuance systems. Projected monthly operating costs for a nationwide EBT system are higher. Estimated monthly Food Stamp Program operating costs for an EBT system serving both the Food Stamp and AFDC programs are $4.51 to $5.57 per food stamp household. AFDC program costs are $2.90 to $3.52 per household. Monthly operating costs are quite similar across development approaches; the variation in per-case-month costs arises from different assumptions about system design (e.g., PIN assignment or PIN selection) and individual cost factors.

The above range in estimated monthly costs reflects experience with current EBT demonstrations and policy decisions made to date. For an EBT system to be cost-effective, some changes need to occur. An analysis of the sensitivity of the cost estimates to individual assumptions shows that Food

Stamp Program costs could be as low as $3.36 per case month or as high as $6.35. AFDC costs could vary between $2.62 and $3.42 per case month. Most of this additional variation is attributable to public and private sector decisions about the extent of terminal deployment and the outcome of negotiations on transaction processing costs. While it is impossible to accurately forecast the latter, it is clear that the terms of cost-sharing will be a determining factor in any large-scale expansion of an EBT system.

A multiprogram EBT system is more cost-effective than a system serving only the Food Stamp Program. In a Food Stamp Program-only system, costs would be about $.45 per case month higher than the estimates provided above.

Reductions in levels of benefit diversion can offset some of the cost disadvantages of an EBT system and improve the public's perception of the integrity of the Food Stamp Program.

The present coupon-based system incurs some loss of benefits during issuance and a more substantial amount of benefit diversion. While benefit loss adds directly to program costs (e.g., replacement of coupons reported as lost or stolen in the mail), benefit diversion shifts the use of program funds from their intended purpose. Examples of benefit diversion include purchase of ineligible items, trafficking, and use of cash change for non-food items. The first two examples represent a violation of program rules.

Based on an evaluation of the Reading EBT demonstration, the introduction of an EBT system is likely to have little effect on net levels of benefit loss in the Food Stamp Program, because these levels are already low in the coupon-based system (totalling only about $.09 per case month). An EBT system, however, can be very effective in reducing diversions of program benefits from intended uses. By eliminating cash change and reducing the opportunity for benefit trafficking, levels of benefit diversion may be reduced by nearly 80 percent, or an estimated average of $2.45 per case month.[1] While this reduction does not translate into savings in program costs, more benefits are directed toward food purchases. This will increase

[1] John A. Kirlin et al., The Impacts of the State-Operated Electronic Benefit Transfer System in Reading, Pennsylvania, Cambridge, Massachusetts: Abt Associates Inc., February 1990, pp. 144-146.

food stamp redemption levels among food retailers and improve the public's perception of the integrity of the Food Stamp Program.

Implementation of a nationwide EBT system will require cooperation among various Federal Agencies and other organizations.

Before a nationwide EBT system can be implemented, basic decisions must be made about system design; development approach; which programs to include; sources of funding; and, possibly, appropriate design standards. Because an EBT system will affect many different groups, cooperation among the groups is needed to address these basic issues. To achieve the needed cooperation among groups and coordination of effort, an advisory group or task force could be established. In addition to representing various Federal Agencies, the group could consult with representatives of State governments, client advocacy groups, retailer associations, financial institutions, and POS and ATM networks, working to establish a Federal/State/private sector partnership addressing the issues faced in implementing a nationwide EBT system.

The need for interagency coordination will not end with system implementation. If a Unitary EBT system is implemented, an ongoing need to manage the system vendor's contract will exist. Regardless of system design and development approach, Federal Agencies will need to respond to possible problems with system operations and performance, or requests for future enhancements to the system.

A nationwide EBT system will alter the relationship between FNS and State Agencies in the administration of the Food Stamp Program.

In the current coupon-based issuance and redemption system, State Agencies assume the major share of responsibility for issuing program benefits. FNS manages the benefit redemption process. A nationwide EBT system will shift the boundaries of these administrative responsibilities. If the Multiple or Standardized Design approach to system development is followed, for instance, State Agencies become involved in benefit redemption for the first time. Their vendors will be responsible for seeing that POS terminals are deployed in retail locations, that retailers are trained, and that retailers receive credit for EBT transactions. Conversely, in a Unitary EBT system, FNS becomes directly involved with benefit issuance through its oversight of the system's vendor. Thus, regardless of development approach,

either FNS or State Agencies assume new responsibilities in program administration.

These shifts in administrative responsibilities point out the need for close cooperation between Federal and State Agencies in the implementation of a nationwide EBT system. For instance, reporting requirements will need to be updated, and questions of appropriate cost allocations will need to be addressed.

Implementation of a nationwide EBT system will require legislative and regulatory changes for the Food Stamp Program, and the system will have to operate within the framework of other State and Federal regulations.

The Food Stamp Act of 1977 and program regulations require that program benefits be issued in the form of food stamp coupons. Thus, both the authorizing legislation and the regulations need to be changed before a nationwide EBT system can be implemented. Amendments to the Food Stamp Act which would authorize EBT systems are presently being debated. Legislative proposals include language which would allow State Agencies to implement on-line EBT systems beginning in 1992. Prior approval would be needed from the Secretary of Agriculture, and the Secretary would first need to promulgate regulations dealing with standards of cost-effectiveness, recipient protection, system operations and performance, financial accountability, and other factors.

An EBT system will also need to operate within a legal environment defined by other relevant Federal and State statutes and regulations. In designing an EBT system, therefore, system developers will need to pay heed to the Privacy Act of 1974 (which governs record maintenance procedures for both Federal Agencies and entities operating under Federal contract) and Federal and State banking laws. If a Unitary Design approach is followed, the resulting EBT systems will have to conform to the Computer Security Act of 1987, which seeks to protect the integrity and security of sensitive data contained within Federal computer systems.

CONCLUSIONS

A number of factors contribute to a positive assessment for the feasibility of implementing a nationwide EBT system. An EBT system can reduce administrative error and levels of benefit diversion, increase program

accountability, and provide improved service to program recipients. Most importantly, such a system is technically feasible, and many States already are interested in replacing their paper-based coupon issuance systems with an EBT system.

The biggest obstacle to a nationwide EBT system is its projected cost. Initial development and implementation costs are high, and system operating costs are likely to be higher than the costs of current issuance systems. There are some EBT benefits to consider, however. These benefits include a reduction in benefit diversion and improved image of the Food Stamp Program's integrity, convenience for recipients and food retailers, and less hassle for State and local staff.

Integration of EBT systems and commercial POS and ATM networks is an important goal. An integrated system offers lower system development and implementation costs, lower system operating costs through processing efficiencies, better service to program recipients, and greater marketability of the system within the retail sector. A stand-alone EBT system operating independently of commercial networks is not a feasible alternative for a nationwide system. Thus, Federal and State Agencies need to work closely with network representatives. To facilitate system integration, an EBT system will have to adopt design standards which are compatible with standards established in the private sector.

If a nationwide EBT system is to be implemented, it should be designed to serve both the Food Stamp Program and other cash assistance programs. A multiprogram system will spread costs over more programs, improving its cost-effectiveness for each program. Such a system will also gain greater support from State Agencies.

Neither the Multiple Design nor the centralized Unitary Design

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Chapter One

INTRODUCTION

The Food Stamp Program assists needy households by providing benefits which can be used to purchase food. Benefits are currently issued in the form of paper food stamp coupons. As outlined below, the use of coupons and other paper documents makes benefit issuance and redemption a cumbersome process for all participants: State Food Stamp Agencies and their local offices; program recipients; program-authorized retailers; financial institutions; and the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture.

In Fiscal Year 1988, State and local agencies issued approximately 40 million Authorization-to-Participate (ATP) documents to recipients, and these recipients made approximately 40 million trips to coupon issuance sites to exchange their ATPs for coupons. FNS and State and local agencies printed, shipped, stored and distributed approximately 2.1 billion paper coupons. Retailers accepted these coupons in lieu of cash for over $11 billion worth of groceries.

After receipt of the coupons, retailers sorted, counted, and endorsed the coupons; filled out an estimated 46 million Redemption Certificates; and deposited the coupons and certificates at their local financial institutions. Financial institutions counted the coupons, verified the totals with the amounts listed on the Redemption Certificates, filled out Food Coupon Deposit Documents, and submitted the coupons and paperwork to the Federal Reserve. Federal Reserve Banks, in turn, reverified the totals, checked for counterfeit coupons, destroyed the coupons, and credited the sending institutions' accounts. Finally, FNS monitored and reconciled this flow of paper and benefits through receipt of numerous reports from State Agencies and the Federal Reserve.

Because food stamp coupons represent an alternative form of currency (albeit with restricted use), strict administrative controls must be maintained over the printing, storage, delivery and redemption of these coupons and associated authorization documents. Partly as a result of the difficulty of implementing these controls, coupon issuance systems are vulnerable to benefit dollar loss resulting from fraud and error. While the magnitude of

actual issuance loss is relatively small (about $17.6 million in FY 1988, or 0.16 percent of benefits issued), the program's public image is damaged by their existence and other actions which divert benefits from their intended use. Examples of benefit diversion include the provision of cash change in amounts less than $1.00 (which is legal) and recipients' sale of coupons for cash at discounted values (often called "trafficking," which is illegal).

1.1 INVESTIGATION OF ELECTRONIC BENEFIT TRANSFER SYSTEMS

In an effort to improve program integrity and the efficiency and accuracy of benefit delivery and redemption, FNS has been studying alternative methods of issuing program benefits. One method which has received considerable attention in the past several years is the use of electronic benefit transfer (EBT) systems. In an EBT system, a recipient's monthly benefits are posted to a computer account, and the recipient is issued an EBT access card. When purchasing groceries, the recipient and retailer use the card and a point-of-sale (POS) terminal to request authorization from the EBT computer system. At the end of the day, the retailer's authorized EBT sales are totalled, and an electronic funds transfer deposits the store's EBT credits into the store's bank account. Thus, when benefits are issued and redeemed through an EBT system, the need to print, store, issue and redeem paper food stamp coupons is eliminated.

The possible use of an EBT system for benefit issuance and redemption offers several potential advantages beyond eliminating the use of food stamp coupons and the benefit losses and diversions associated with coupon use. An EBT system works very much like commercial debit card systems, offering an opportunity to integrate private and public infrastructures for financial transactions. An EBT system also can be expanded to serve other government transfer programs, providing greater integration of public programs and consolidation of services. Finally, an EBT system allows program recipients to use payment authorization techologies being used by the general public, which serves to reduce the distinction between program beneficiaries and the public.

FNS' investigation of the feasibility and cost-effectiveness of using EBT systems has been extensive. After funding a 1982 study which

examined the technical and economic feasibility of an EBT system,[1] FNS sponsored a demonstration of an "on-line" EBT system in a single test site--Reading, Pennsylvania. In an on-line EBT system, information about recipients' benefits is maintained in a central database. When recipients wish to use their program benefits, the POS terminal communicates with the system's database to ascertain whether sufficient benefits remain for the desired purchase amount.[2]

FNS also sponsored an evaluation of the Reading EBT demonstration to determine the impacts of the EBT system on the administrative costs of issuing and redeeming program benefits, on program vulnerability to benefit loss and diversion, and on all major participants (i.e., recipients, retailers and financial institutions). The evaluation found that most system participants preferred the EBT system to the coupon-based system it replaced, and that the EBT system reduced their costs to participate in the Food Stamp Program. The evaluation also determined that the EBT system could reduce the Food Stamp Program's vulnerability to benefit loss and diversion. The administrative costs of the EBT system, however, were nine times greater than the costs of the coupon system.[3]

In 1985, the Pennsylvania Department of Public Welfare (PDPW) requested an extension of the Reading EBT demonstration. FNS agreed to the request, providing that the PDPW assume operating responsibility for the system from its private developer, improve system performance, and reduce operating costs. Pennsylvania assumed operating responsibility for the system in April 1986. In June 1987, PDPW implemented a redesigned system in an

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[1]Report on the Feasibility of an Electronic Benefit Transfer System for the Food Stamp Program, Silver Spring, Maryland: Birch & Davis Associates Inc. and The Orkand Corporation, March 1982.

[2]In contrast, an "off-line" system stores information about each recipient's remaining benefits in that recipient's EBT access card. This eliminates the need to communicate with a central database before authorizing the purchase. FNS required that the initial demonstration use on-line rather than off-line technologies because the 1982 study concluded that off-line technologies were not yet sufficiently developed.

[3]William L. Hamilton et al., The Impact of an Electronic Benefit Transfer System in the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., May 1987.

effort to improve system performance and reduce costs. An evaluation of the extended demonstration was recently completed. Recipients, retailers and financial institutions continued to prefer the EBT system to the coupon system, and the redesigned system reduced system operating costs by two-thirds, largely through reductions in computer operator labor costs as EBT functions and other PDPW computer operations were integrated on a single computer system.[1] The reduced administrative costs, however, were still about three times higher than coupon system costs.

FNS expanded its investigation of EBT systems in 1988 by inviting interested State Agencies to submit proposals for new EBT demonstrations. Although FNS continued to require that any new EBT systems use on-line technologies, FNS encouraged States to expand the EBT system to include other assistance programs or to integrate their proposed systems with existing commercial POS networks. The object of encouraging an integrated design was to see whether the Food Stamp Program's portion of the administrative costs of an EBT system could be further reduced, compared to the costs of a food stamp-only system. FNS entered into cooperative agreements with two States for EBT demonstration projects: Minnesota and New Mexico.[2] These demonstrations are being evaluated by Abt Associates. In addition, Maryland submitted an unsolicited EBT proposal to FNS and received a waiver to operate an EBT system. That system has been implemented and is being evaluated by the State. Other States may be granted similar waivers in the future.

Recognizing that commercial development of off-line technologies has advanced since the early 1980's, FNS contracted for a second feasibility study in 1986. The study investigated possible alternative designs for an off-line EBT system and the technical and economic feasibility of each alternative. It concluded that an off-line EBT system is technically feasible and that such a

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[1] John A. Kirlin et al., The Impacts of the State-Operated Electronic Benefit Transfer System in Reading, Pennsylvania, Cambridge, Massachusetts: Abt Associates Inc., February 1990.

[2] FNS also had cooperative agreements with Arizona and Washington, but State spending cuts and other cost factors led to cancellation of these projects.

system appears feasible in terms of its development and operating costs.[1] As a result of this assessment, FNS is sponsoring an EBT demonstration using off-line technology.

1.2 REPORT PURPOSE

If current and planned EBT demonstrations show that cost-effective EBT systems can be implemented without negative impacts on program participants, a number of questions naturally follow. To what extent should EBT systems be implemented throughout the county as an alternative to the present coupon issuance system? Could coupon use be completely eliminated through implementation of a nationwide EBT system? Would a nationwide system serving the entire Food Stamp Program caseload (or a large portion of the caseload) be technically feasible? Would it be cost-effective? What would be the obstacles to implementing a nationwide EBT system? Finally, if FNS decided to encourage the implementation of a nationwide EBT system, what would be the best approach to developing such a system?

This report examines these questions by assessing the feasibility of a nationwide EBT system. Like the previous feasibility studies, this study is exploratory. It begins by identifying three possible approaches to developing a nationwide EBT system. The three approaches differ primarily in terms of what types of restrictions FNS would place on system design and who would take the initiative for developing the system--FNS or individual State Agencies. The report then examines those factors which affect the feasibility of implementing a nationwide EBT system. Relevant questions include:

- What organizational changes would be required at the Federal, State and local levels to develop and operate a nationwide EBT system?
- Does the technology exist for a nationwide EBT system?
- What might be the performance characteristics of a nationwide EBT system?

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[1] Paul F.P. Coenen et al., The Feasibility of an Off-Line Electronic Benefit Transfer System for the Food Stamp Program, Atlanta, Georgia: Electronic Strategy Associates, Inc. and Abt Associates Inc., September 1987.

- What legislative or regulatory issues must be considered in an effort to implement a nationwide EBT system?
- To what degree might a nationwide EBT system be integrated with existing commercial POS networks?
- To what extent are States interested in providing EBT systems as an alternative issuance system?
- What would be the cost of developing and operating a nationwide EBT system?

Each of these factors is examined in the context of the three alternative development approaches. Thus, the report essentially addresses the feasibility of implementing a nationwide EBT system under each of the three development approaches identified at the beginning of the report.

Due to the exploratory nature of the study, it would be premature to base future decisions about the use of EBT systems on the results of the study. The feasibility of a nationwide EBT system will depend, in part, on retailers' adoption of commercial POS systems over the next several years and on retailers' and POS and ATM networks' willingness to work with Federal Agencies to implement a cost-effective system. Furthermore, the report's estimates of system development and operating costs are based partly on experience with the Reading EBT demonstration. As additional EBT demonstrations are evaluated, FNS will have more empirical data to use in assessing the feasibility of future systems. Nevertheless, this study provides a context in which to interpret those empirical results, especially in its focus on issues of large-scale implementation, which the individual demonstrations cannot address directly.

In examining the feasibility of a nationwide EBT system, the task becomes easier as the nature of the proposed system becomes more detailed. For instance, evaluating the feasibility of an on-line EBT system is more straightforward than an off-line EBT system, because on-line debit card systems have progressed further in the marketplace than off-line systems. The report, however, avoids restricting either the end design of a system or the approach to implementing a system as much as possible. Until current and planned EBT demonstrations are completely evaluated, it is premature to narrow the field of possible design and development approaches. By necessity, however, preserving a wide range of options for system design and development

limits the report's ability to assess the feasibility of specific design and development options.

Even with a general goal of not limiting system design and development options, some restrictions have been necessary. Because all the current State-initiated EBT demonstrations have chosen a multiprogram EBT system in an effort to improve cost-effectiveness, the report assumes that a nationwide EBT system would serve cash assistance programs as well as the Food Stamp Program. In discussing many of the factors affecting the feasibility of a nationwide EBT system, the number of programs served by the systems is immaterial. Thus, this "restriction" in design does not affect the findings of the report. When assessing the costs of developing and implementing a nationwide EBT system, however, the decision to focus on a multiprogram system is important.

The report also focuses on implementation of an on-line EBT system, because the existence of many commercial on-line debit card systems provides a great deal of information about design and economic feasibility. An appendix to the report discusses issues pertaining to the feasibility of a nationwide off-line EBT system.

Finally, the study assumes that a nationwide EBT system is most likely to be integrated with commercial POS and ATM (automated teller machine) networks. Such integration will reduce system development and operating costs through use of existing software, POS terminals and ATMs. It will also be more acceptable to retailers than a stand-alone payment system that serves only program recipients.

1.3 RESEARCH METHOD

This study has used a variety of resources to assess the feasibility of a nationwide EBT system. These resources include the technical expertise of a consultant with a significant amount of experience in on-line POS debit card operations, interviews with State officials and industry representatives, a review of trade publications following the development of the commercial POS industry, and a review of pertinent legislation and regulations. The report also draws extensively on the authors' familiarity with the Food Stamp Program and the EBT demonstrations sponsored by FNS.

In assessing organizational changes needed at the Federal, State and local level to implement a nationwide EBT system, the report has benefited from a previous report focusing on similar issues.[1] Interviews were also conducted with other Federal Agencies and vendors who have already grappled with the problem of setting up national databases to serve Federal programs.

The technical feasibility of a nationwide EBT system has been assessed by a technical consultant and has been supported by interviews with a number of industry representatives.

With respect to the potential impact of existing legislation and regulations on development of an EBT system, the following have been reviewed: the Food Stamp Act of 1977, as amended; Food Stamp Program regulations; the Privacy Act of 1974; the Computer Security Act of 1988, the Federal Reserve Board's Regulation E; and State banking laws.

The feasibility of implementing a nationwide EBT system depends in large part on whether or not State Agencies will be interested in implementing such systems as an alternative to their present coupon-based issuance systems. To determine the degree of State interest in EBT systems, interviews were conducted with Food Stamp Program directors (or other personnel recommended by the director) in 25 States. These interviews focused on each State's current level of knowledge and interest in EBT systems, local obstacles to system implementation, and a likely timeframe for developing an EBT system initiative.

The report's estimates of the costs of developing and implementing a nationwide EBT system are based on cost models developed for several previous EBT studies, cost data from the Reading EBT demonstration, and interviews with the following industry representatives:

- Melissa Beidler of Bank of America;
- Rod Cullison of the First National Bank in Albuquerque;
- Ron Cummello of Martin Marietta;
- Stan Paur and Steve Van Fleet of Pulse;
- Wayne Sanderford of TransFirst; and
- Peter Skepstedt of Travelers Express.

[1] Christopher W. Logan, Food Stamp Program Administration in an Electronic Benefit Transfer System, Cambridge, Massachusetts: Abt Associates Inc., forthcoming.

While the cost estimates strive to be as complete and accurate as possible, uncertainty always exists when estimating the costs of a system whose detailed design has not been specified. Where appropriate, the report indicates alternative design features and cost assumptions, and the impacts of these alternatives on total system development and operating costs.

Chapter Two

DEVELOPMENT OF A NATIONWIDE EBT SYSTEM

The primary objective of this report is to examine the feasibility of developing and implementing a nationwide EBT system. In doing so, we need to define in broad terms the characteristics of a nationwide system. These characteristics may affect the technical and economic feasibility of an EBT system, as well as the system's acceptability to State Agencies, retailers and recipients.

A nationwide EBT system is likely to be integrated with existing commercial POS and ATM networks. This chapter therefore begins by describing the organizational characteristics of these networks. Section 2.2 then describes the major functions and tasks to be performed in an EBT system.

The characteristics of a nationwide EBT system will depend, in part, on the process which is followed in developing and implementing the system. Section 2.3 describes three major alternative approaches to system development, and these three approaches provide a framework for many of the feasibility issues discussed in later chapters. The participants in a nationwide EBT system are described in Section 2.4. Finally, Section 2.5 addresses some of the operating parameters of a nationwide system, giving the reader a sense of the magnitude of a truly nationwide EBT system.

2.1 ORGANIZATIONAL FEATURES OF COMMERCIAL POS NETWORKS

We refer throughout this report to commercial point-of-sale (POS) networks. In many commercial POS networks, however, point-of-sale transactions currently form a very small part of the network's overall operations. Most networks originally formed to route and process debit transactions at automated teller machines (ATMs), which is still their major transaction base. Only recently have the networks and their participating institutions (mostly banks or major retail organizations) started offering debit card authorization services at the point of sale. Some networks process only ATM transactions; a few process only POS transactions.

Any POS network is composed of five different entities, although a single organization often performs the duties of more than one entity. The five entities are:

1) card issuers, the organizations (usually financial institutions or major retailers) who issue debit cards to cardholders;

2) card acceptors, the merchants and financial institutions who accept cards at POS terminals or at ATMs;

3) acquirers, the organizations who drive POS terminals or ATMs, accepting transaction data from card acceptors;

4) intermediate network facilities, or switches, the organizations which route transactions between acquirers and transaction authorizers; and

5) transaction authorizers, the organizations who authorize or reject transaction requests.

Transaction authorization is usually performed either by card issuers or by acquirers acting as agents for card issuers.

In a simple POS network, one or more financial institutions issue debit cards to their depository account customers. A customer uses his or her card at an ATM or a POS terminal, and the ATM or POS terminal transmits the transaction request to a single intermediate network facility (or switch). The switch routes the transaction request to the institution which issued the card, and that institution authorizes or rejects the transaction after checking the cardholder's remaining deposit balance. The institution's response message is transmitted back to the switch, which routes the response to the ATM or terminal. During network settlement, the switch initiates a transaction which transfers funds from the cardholder's financial institution to the institution which owns the ATM or which holds the retailer's depository account.

A more complex network is illustrated in Exhibit 2-1. In this illustration, Switch A is directly linked to three acquirers. Each acquirer drives either POS terminals or ATMs (or both) which are located on the premises of card acceptors (e.g., merchants or financial institutions). In addition, each acquirer provides card authorization services for two card issuers (CIs). The switch also has direct links to two card issuers who perform their own transaction authorizations.

Switch A in Exhibit 2-1 also connects to a second switch (Switch B). Switch B has its own set of acquirers, card acceptors and card issuers

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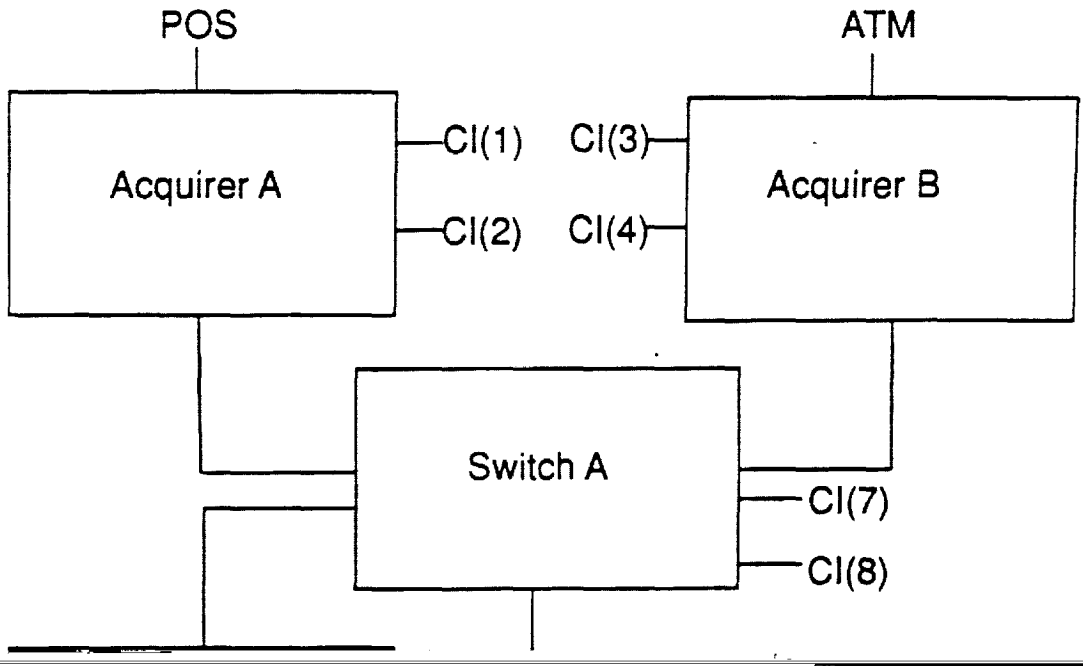
Exhibit 2-1

HYPOTHETICAL POS NETWORK



(not shown in the diagram). Switch B may serve a different geographic area, or it may serve a different set of card issuers and card acceptors within the same locale as Switch A. In either case, the link between the two switches allows cardholders access to a wider range of ATMs and POS terminals.

Each switch in a network contains a central routing computer and software which allows the multiple acquirers to exchange transaction data. Acquirers maintain control files identifying all authorized terminals, and the switch maintains a file of card-issuing organizations and a record of which organization is expected to authorize transactions for each card base. Typically, acquirers and the switch operate 24 hours a day, 7 days a week, except for short periods of scheduled maintenance.

The operations of the early ATM network switches were usually placed in the hands of one of the participant banks. As networks developed, this was believed to provide an undue competitive advantage to the network participant running the switch, and a migration began to independent switch-operating entities or third parties. Even though the operation of the switch is now one step removed from the participants, network operating rules and bylaws strictly govern the behavior of the switch operator, and they may specify which organizations can effect a direct switch link for authorizations and interchange of transactions among the network participants. Thus, if an EBT system is to be integrated with a commercial POS network, the network may need to change its bylaws or a member institution may need to act as a sponsor for the EBT system vendor providing authorization services.

Although the number of card authorizing institutions (including card issuers and acquirers) that participate in individual ATM/POS networks used to be relatively small, the trend in recent years has been toward greater participation. Some networks serve well over 1,000 member institutions. Requirements for these institutions' technical processing abilities and response times for transaction authorizations are set by the network. A card authorizer that chooses to link to the network must agree to meet these standards and to abide by all the requirements stated in the network's operations guidelines.

In most large networks composed of multiple acquirers, the switch does not own or drive terminals, but acts only as a router for transactions between terminals and the authorizing acquirer or financial institution.

These networks are referred to as interchange networks. The hypothetical network shown in Exhibit 2-1 is an example of such a network. When networks that provide switching services also drive terminals, they are usually referred to as shared networks. In shared networks the switch may maintain the authorization files for some participants. When an entity operates a network entirely for itself, performing switching, card authorization, card-issuing, and terminal driving functions, it is referred to as a proprietary network. If one broke the connection in Exhibit 2-1 between one of the acquirers and Switch A, that acquirer and its linked entities would be a shared or proprietary network.

Shared, proprietary and interchange networks can operate on a regional or a national basis. At present, six national networks exist (Cirrus, Plus, Visa, CitiShare, The Exchange, and Express Cash), and they process mostly ATM transactions. The first three are interchange networks, while the last three are shared networks. There are approximately 95 regional networks, and nearly all are shared or interchange networks. Among the regional networks, the major POS debit network is Interlink, which processes about 46 percent of all POS debit card transactions nationwide.

2.2 MAJOR FUNCTIONS AND TASKS TO BE PERFORMED BY AN EBT SYSTEM

An EBT system will replace the Food Stamp Program's current coupon-based system for issuing benefits to program recipients and for redeeming these benefits after they are used at participating retail food outlets. The system must therefore perform the following five basic benefit issuance and redemption functions:

1) authorize recipient access to benefits,

2) allow recipients to use benefits,

3) credit retailers through financial institutions for benefits accepted,

4) reconcile and monitor benefit flows and system activity, and

5) manage retailer participation.

In performing these functions, the system must meet strict standards of financial accountability and facilitate the enforcement of program regulations concerning benefit issuance, use and redemption.

If an EBT system served cash assistance programs, additional functional requirements would include:

6) allow cash assistance recipients to withdraw benefits at POS terminals or ATMs,

7) credit ATM owners and retailers with POS terminals for cash withdrawals, and

8) manage ATM network participation.

Retailers other than Food Stamp Program-authorized stores also could participate in the cash assistance portion of the system, thereby expanding the scope of the retailer crediting and management functions.

A number of specific tasks must be performed to support each major function. These tasks are described in the following sections.

Authorize Recipient Access to Benefits

Eight tasks must be performed to authorize recipient access to benefits in an EBT system:

1) certify recipient's eligibility for program participation,

2) determine the amount of benefits to be provided to the recipient each month,

3) place household data and current allotment information on the Food Stamp Master File,

4) create an issuance authorization file,

5) create recipient's EBT account record,

6) post benefits to recipient's EBT account,

7) issue EBT access card, and

8) train recipient in how to use the system.

The first three tasks are not affected by the choice of a particular benefit issuance and redemption system. A State Agency's procedures for performing these three tasks will remain the same whether benefits are issued as food stamp coupons or as "electronic" benefits which can be accessed through an EBT system.

Create Issuance Authorization File. Based on the allotment information placed on the Food Stamp Master File, a State Agency must create an issuance authorization file which lists all recipients receiving benefits that day and the amount of each issuance. Program recipients usually receive one regular issuance within the first ten days of each month. Newly certified recipients or recipients eligible for additional benefits may receive a prorated or supplemental issuance at any time of the month.

Create EBT Accounts. An EBT system will maintain recipients' benefits in a computerized EBT account. These accounts will be contained in an EBT Client Authorization File (CAF). For recipients receiving their first benefit issuance under an EBT system, an account record needs to be created and added to the CAF. At a minimum, this record will contain one or more variables identifying the recipient, an encrypted form of the recipient's personal identification number (PIN), and a field containing the recipient's current EBT balance. Likely identifying information will be the recipient's Food Stamp Program case number and a special EBT account number which uniquely identifies the account.

Post Benefits to Accounts. The issuance authorization file will be used to post benefits to recipients' EBT accounts on the CAF. For existing participants, the issuance will be added to the recipient's then-current EBT balance.

Issue Debit Cards. Food Stamp Program recipients will access their benefits in an EBT system by using an EBT debit card at POS terminals located at participating retailers' checkout counters. These cards must be created and issued to recipients. If an EBT system uses standard magnetic stripe debit cards at the point of sale (as nearly all commercial POS systems do), the magnetic stripe on the card must be encoded with identifying information about the recipient.

Train Recipients. All program recipients must be instructed in how to use their cards to access benefits at POS terminals. Recipient training also will need to cover topics related to how to check remaining balances, whom to call when problems are encountered, and the need to keep PINs secret to prevent unauthorized use of the card.

Allow Recipients to use Benefits

To allow recipients to use their EBT benefits to purchase groceries, the State Agency or the network operator (or another network participant working with the Agency) must perform seven separate tasks:

1) drive terminals,

2) maintain recipient accounts,

3) verify recipient's identity at point of sale,

4) electronically process purchase and refund transactions,

5) authorize manual sales and post manually authorized debits to recipients' accounts,

6) provide balance information, and

7) convert EBT benefits to coupons.

The same organization need not be responsible for all seven tasks.

Drive Terminals. Each deployed POS terminal in a nationwide EBT system must be "driven" by a transaction acquirer. All terminals, however, need not be driven by the same acquirer.

Terminal driving refers to the process of receiving transaction messages from a terminal, reformatting these messages (if necessary) for further processing, routing the transaction message on to a switch for authorization, and transmitting messages back to the terminal.

Maintain Recipient Accounts. The Client Authorization File will contain account records for each participating food stamp recipient. The account records will contain each recipient's current balance of remaining benefits and sufficient information to uniquely identify the account and to verify the identity of the card user (i.e., an encrypted version of the recipient's PIN). Each account's remaining balance must be updated as issuances are posted and as EBT purchases or refunds are authorized and processed.

Account maintenance also requires that the account be placed on "hold" when the recipient reports that his or her EBT debit card has been lost or stolen. This status prevents further access against the account. When a new card is issued, access to the account must be reinstated.

Because recipients may still have benefits remaining in their accounts when they leave the Food Stamp Program, account records must be maintained for these recipients until all benefits are exhausted or some specified period of account inactivity has elapsed. The State Agency, in conjunction with the Food and Nutrition Service, will be responsible for setting policy on when recipient accounts can be deleted from the Client Authorization File.

Verify Recipient's Identity. Before an EBT debit card can be used at a point of sale or to access information about the account's remaining balance, the identity of the cardholder must be verified. Verification requires that the cardholder enter the account's correct PIN and that the system check the entered PIN against the PIN information contained in the CAF.[1]

Electronically Process Transactions. For purchase and refund requests entered at an authorized EBT terminal, an EBT system must electronically process the transaction request. Processing purchase requests requires a check for sufficient funds in the recipient's EBT account. If the remaining funds are not sufficient to cover the intended purchase, the purchase request is denied. If sufficient funds exist, the recipient's EBT account is debited by the purchase amount and the retailer's system account is credited by the same amount.

As purchases or refunds are processed, a record of the transaction must be added to the system's transaction log file. The transaction record should identify the type and amount of the transaction, the account to be debited, the account to be credited, and the date and time of the transaction.

Authorize Manual Sales. If a store's EBT equipment is not working or if the system cannot provide electronic authorization of a purchase request, procedures must be available for the manual authorization of EBT purchases. To reduce the exposure to possible overdrafts, the State Agency

[1]Other verification procedures are possible, including signature verification and biometric approaches which measure handprints, retina information, or handwriting dynamics. The use of PINs, however, is widely considered as offering the best combination of security and cost-effectiveness.

may specify an upper limit for the daily amount of manually authorized EBT purchases for each EBT account. The Agency also may specify the conditions under which manual authorization is acceptable.

When EBT purchases are manually authorized, the amount of the purchase must be debited from the appropriate recipient account. This will require manual entry of the debit information to the system's transaction file. The transaction file entry will result in a debit to the recipient's CAF record.

Provide Balance Information. An EBT system must provide one or more ways for food stamp recipients to check their current remaining EBT balances. Although receipts for each EBT purchase may record the recipient's remaining balance after the purchase, this balance information will become out of date if either (a) an issuance is subsequently posted to the recipient's account, or (b) a manually authorized sale is debited against the account. An EBT system, therefore, must allow recipients on-line access to the system to check their account balance.

Convert EBT Benefits to Coupons. Because food stamp recipients with benefits remaining in their EBT accounts may move out of the area served by an EBT system, the system must provide a means for their EBT benefits to be converted to food stamp coupons. This can be accomplished by adding a "convert benefits" transaction capability to the system. After determining a recipient's current remaining balance, the State Agency--through a local welfare office--would initiate this transaction type for the remaining benefit amount. The recipient's EBT account would be debited to zero, and the local welfare office would issue coupons or an Authorization-to-Participate (ATP) document to the recipient. The ATP could be redeemed for coupons at a local issuance office.

The State Agency, in conjunction with FNS, will have to establish a policy for when EBT benefits may be converted. In addition to converting all remaining benefits when recipients move away, the Agency could allow recipients to convert some or all of their benefits if they plan on traveling or if they wish to shop in local stores not participating in the EBT system.

Credit Retailers for Benefits Accepted

Three tasks must be performed to credit retailers for EBT sales:

1) create and maintain system accounts for retailers,

2) reconcile manual debits, and

3) post credits to retailer accounts.

Create and Maintain Retailer Accounts. All retailers participating in an EBT system must have computerized accounts set up and maintained by the organization driving their terminals. Account records will include information identifying the retailer, information identifying the bank account to which POS credits will be transferred, and space for maintaining the retailer's cumulative POS credits for each processing day. The account records also may contain information specifying the retailer's selected cut-off time for account settlement and posting.

Reconcile Manual Debits. Just as debit information from manually authorized EBT sales must be posted against recipient accounts, the corresponding credit information must be posted to retailer accounts. This crediting could be accomplished when the retailer sends proof of the transaction (most likely in the form of a signed sales receipt) to the party responsible for reconciling the amount of the credit against the amount that was previously debited from the recipient's account. After the manual debit is reconciled, the party must manually enter the appropriate credit information onto the retailer's system account. Alternatively, the retailer's account could be credited at the time of the sale. If the manual sales slip was not submitted for reconciliation within a specified period, the transaction would be reversed, thereby increasing the recipient's account balance by the amount of the manually authorized transaction.

Post Credits to Retailer Accounts. Retailers participating in an EBT system receive funds for system-authorized POS transactions when POS credits are posted to an account at their own financial institution. The organization driving a retailer's terminals is responsible for posting the retailers' total net credits (i.e., total credits minus total refunds) at the end of each processing day. In most commercial POS networks, the daily credit information is sent to the network's clearinghouse bank. The bank initiates

an electronic funds transfer to retailers' bank accounts by transmitting the credit information through the Federal Reserve System's Automated Clearing House (ACH) network. In some networks, the terminal driver or the network operator may initiate the ACH funds transfer process itself.

Because FNS maintains and analyzes retailers' monthly food stamp redemption levels, the above process must be able to distinguish EBT system credits from other credits on a store-by-store basis. The process also must provide information on total redemptions within each State, an important consideration to note if an EBT system vendor is providing services to more than one State Agency.

In a commercial POS system, the clearinghouse bank's Federal Reserve account is debited by the total amount of retailer credits transferred through the ACH network. This debit is offset by simultaneous credits from the card-issuers' Federal Reserve accounts. For an EBT system, the clearinghouse bank could be reimbursed from a U.S. Department of Agriculture Food Stamp Program account at the U.S. Treasury (which might entail a slight delay in funds availability) or from a program account maintained at a Federal Reserve Bank (which would allow immediate funds availability).

Reconcile and Monitor Benefit Flows and System Activity

Six tasks must be performed to reconcile benefit flows through an EBT system and to provide management information about system activity to the State Agency:

1) reconcile benefit issuances,

2) reconcile EBT account and transaction activity,

3) reconcile retailers' EBT deposits,

4) reconcile EBT deposits against Treasury reimbursements,

5) provide system performance data, and

6) provide other management data.

Reconcile Benefit Issuances. To detect possible errors when food stamp allotments are posted to recipients' EBT accounts, the total number and dollar value of issuances actually posted to recipients' accounts should be reconciled against the total number and dollar value of issuance records on the daily issuance authorization file created by the State Agency.

Reconcile EBT Account and EBT Transaction Activity. At the end of an EBT system's processing day, all EBT transaction records (i.e., issuances, purchases, refunds, manual debits and benefit "conversions") should be reconciled against changes in recipients' remaining balances on the CAF. For each account and for all accounts combined, the net value of all transactions should equal that day's change in remaining balances.

Similarly, the net total value of all EBT purchase and refund records on the transaction file should equal the net change in EBT-related credits to retailers' system accounts.

Finally, total life-to-date benefits entering the EBT system (through posted issuances) minus total life-to-date benefits leaving the system (through EBT deposits to retailers' bank accounts and benefit conversions) should equal the total current remaining balance in recipients' EBT accounts. Because recipient account debits and retailer account deposits for manually authorized sales may not occur on the same day, this latter reconciliation will have to adjust for the total value of manually authorized debits which have not been reconciled by receipt of the stores' signed sales slips.

Reconcile Retailers' EBT Deposits. When retailers' daily EBT credits are posted, the file containing posting information (i.e., the file sent to the network's clearinghouse bank for ACH submission) should be reconciled against the daily system file containing net credits for each participating retailer.

Reconcile EBT Deposits against Treasury Reimbursements. After the clearinghouse bank initiates the daily ACH electronic funds transfer for EBT deposits, the bank will be reimbursed by the U.S. Treasury, usually by the next banking day. Total drawdowns against the Food Stamp Program's Treasury account should be reconciled against total EBT-related deposits on either a daily or weekly basis, taking into account any lag between deposits and reimbursements.

Provide System Performance Data. When a State Agency enters into agreement with a vendor to implement an EBT system, the two parties should agree on performance standards for the system. These standards should cover areas of system accessibility, response times and the like. The Agency and

vendor should establish procedures for monitoring and reporting upon system performance levels each month.

Provide Other Management Data. To support its overall management responsibilities for administering benefit issuance and redemption in the Food Stamp Program, the State Agency will need detailed information on levels of system activity (e.g., number, type and dollar value of EBT transactions), operating costs, and transaction fees. The vendor is likely to be the best source for some of this information; other information is more likely to be available from within the Agency itself.

Manage Retailer Participation

A State Agency or vendor must perform four tasks to manage retailers' participation in an EBT system:

1) maintain the Retailer EBT Participation File;

2) install, service and de-install POS terminals and associated equipment;

3) train retailers to use the system; and

4) support compliance investigations.

Maintain Retailer EBT Participation File. If an EBT system serves cash assistance recipients or if it is integrated with a commercial POS network, some participating retailers may not be authorized to participate in the Food Stamp Program. To ensure that non-program-authorized stores do not accept EBT food stamp transactions, an EBT system must maintain a "Retailer EBT Participation File" of authorized stores that participate in the system. Depending upon system design, either the terminal drivers or the party responsible for authorizing EBT transactions must check the file before accepting or authorizing any EBT food stamp transaction.

The Food and Nutrition Service's field offices authorize stores' participation in the Food Stamp Program. Thus, the party responsible for creating and maintaining the Retailer EBT Participation File must coordinate with FNS' field offices to keep the file up to date. As stores close, change ownership or become disqualified from the program, the file must be updated. Likewise, as new stores are authorized by the field office, these stores must be entered onto the Retailer EBT Participation File.

Install, Service and De-install POS Terminals. As stores enter the EBT system, POS terminals and associated equipment (i.e., card readers, PIN pads, modems and printers) must be deployed at the stores' checkout counters. In multi-counter stores, at least two checkout counters should be equipped with POS terminals so that POS transactions can be performed if a terminal or its associated equipment at one counter malfunctions.

Food Stamp Program regulations prohibit discrimination against or unequal treatment of program recipients. This means that retailers cannot specify individual checkout counters as "Food Stamp Only" lanes. With respect to terminal deployment, FNS' interpretation to date of the regulations is that terminals do not need to be deployed in every lane unless expected peak-hour EBT transaction volumes require full deployment. As long as the lanes with deployed terminals could be used by other customers, no discrimination or unequal treatment would occur. Thus, the two important factors affecting terminal deployment decisions are expected transaction volumes and the costs to deploy and maintain the equipment.

Once POS terminals and related equipment are deployed, the terminal deployer must make arrangements for necessary supplies (e.g., printer paper) to be delivered to the store and for the equipment to be serviced or replaced when it malfunctions.

As stores close or change ownership, the terminal deployer will need to see that the POS equipment is removed from the store. If the equipment is used only for EBT transactions, it also will have to be removed if the store is disqualified from participating in the Food Stamp Program.

Train Retailers. Retailers participating in an integrated EBT system need to learn how to use the system. The amount of training needed will vary according to whether the retailer has prior POS experience and whether or not the retailer is authorized to participate in the Food Stamp Program. If POS procedures differ for EBT and regular POS transactions, these differences will have to be stressed during training. For example, the EBT network will have to support electronic refunds and manually authorized purchase transactions, but these functions may not be available for other POS customers.

In addition to training conducted when the EBT system is implemented, a need exists for ongoing training as stores change ownership or new checkout clerks are hired.

Support Compliance Investigations. The Food and Nutrition Service is responsible for monitoring stores' compliance with program regulations. To support this activity in an EBT system, compliance investigators may need to have special investigatory EBT accounts created and funded and EBT cards issued. These cards and accounts will be used to test whether or not store personnel allow non-eligible items to be purchased with program benefits.

2.3 THREE POSSIBLE DEVELOPMENT PATHS FOR A NATIONWIDE EBT SYSTEM

Conceptually, there appear to be three alternative approaches to develop a nationwide EBT system. The report refers to these alternative paths as the "multiple design" approach, the "standardized design" approach, and the "unitary design" approach. Like many attempts at short-hand nomenclatures, the above names fail to reveal the full range of differences among the three approaches. Nevertheless, because the report will be referring to these approaches throughout each chapter, a short-hand reference is necessary.

"MULTIPLE DESIGN" APPROACH TO DEVELOPMENT

The Multiple Design approach to developing a nationwide EBT system is a continuation of the approach FNS is currently following in the State-initiated EBT demonstrations. Under this approach, FNS specifies what an EBT system must do (via functional and special program requirements) and, if desired, how well it must perform (via performance requirements). The decision of whether or not to participate in an EBT system, however, is left to individual State Agencies.[1] Once a decision to deploy an EBT system is made, State Agencies could contract with vendors to design, develop and operate the system. Alternatively, the Agencies could perform some or all

[1] In States with county-administered programs, the State Agency would first have to decide to participate in an EBT system. Individual County Agencies could then decide whether or not they wished to participate in the State-sponsored system.

of these tasks themselves, although significant in-house expertise would be needed.[1]

We refer to this development approach as a Multiple Design approach because decisions about actual system design are left entirely to the State Agency and its vendor(s). A proposed system design would be allowed as long as the system met FNS' functional, special program, and performance requirements. Thus, it is conceivable that if all States took the initiative to develop EBT systems, a large number of different systems could be developed and implemented. Even if these systems shared some common attributes because they were based on existing commercial POS software, differences would arise to the extent that different vendors were involved and each system was tailored to meet the Agency's specific needs and requirements.

Decisions Affecting System Design

Even with detailed functional and special program requirements, the Multiple Design approach allows States to select whatever design parameters they desire. It is useful to consider in broad terms how system designs might vary across individual States in the Multiple Design approach. The major dimensions along which system designs could differ include:

- the choice of an on-line or an off-line EBT system,
- the benefit programs included in an EBT system,
- the degree of integration with commercial POS and ATM networks,
- whether the vendor or the State Agency authorizes transactions,
- the treatment of manual back-up procedures, and
- system hardware, software and telecommunications configurations.

These design choices are discussed below.

[1] Even Pennsylvania, which had several years prior experience with

On-line versus Off-line. With one exception, all EBT demonstrations to date are based on on-line system designs. An on-line system is characterized by direct communication between the POS terminal and the system's host computer each time an EBT transaction is attempted. During the communication, the terminal sends information about the requested transaction to the host, and the host "tells" the terminal whether the transaction request is authorized or denied. The only record of participants' remaining benefits is in the host's database, which is updated each time a transaction is authorized. For an EBT system which includes cash assistance programs and distribution of cash benefits through ATMs, the request for cash disbursement also involves an immediate transmission of the request to the host computer for authorization.

An off-line EBT system avoids the time and associated cost of establishing a telecommunications link with the host computer by storing information about each participant's remaining benefits on that participant's access card. When the card is used to purchase groceries (or to request cash disbursement), the POS terminal reads the level of remaining benefits from the card. If the remaining benefits are sufficient, the terminal authorizes the transaction and computes the participant's new remaining balance. This new balance is written onto the card's storage medium. An on-line link between the terminal and the host during off-peak hours would most likely be used to pass information about the day's sales to the host, so that settlement could be achieved. During settlement, information about each store's EBT credits for the day would be passed to appropriate financial institutions so that these credits could be paid (settled) using program funds.

Even within an off-line system design, a major design choice must be made about the nature of the system's access card. Possibilities include the standard magnetic stripe card, an integrated circuit card (commonly referred to as a "smart" card or "chip" card), a laser card, and others.[1]

Programs Included. Whereas the Reading EBT demonstration encompasses only the Food Stamp Program, the newer EBT demonstrations also

[1]For a thorough discussion of the topic of access cards which could be used in an off-line EBT system, see Paul F.P. Coenen et al., The Feasibility of an Off-Line Electronic Benefit Transfer System for the Food Stamp Program, Atlanta, Georgia: Electronic Strategy Associates, Inc. and Abt Associates Inc., September 1987.

include cash assistance programs, such as Aid to Families with Dependent Children (AFDC), General Assistance (GA), Refugee Assistance (RA) and Supplemental Security Income (SSI). The New Mexico demonstration also includes a child support component.

With the Multiple Design approach, each State could determine which programs it wanted to incorporate into its EBT system. Programs involving Federal funding would need the approval of the respective Federal Agencies.

Integration with Commercial POS or ATM Networks. Another major design decision is whether to integrate an EBT system with existing POS or ATM networks developed and operated by the private sector. Such integration would improve service to system participants (e.g., by allowing cash assistance benefits to be withdrawn from ATMs). Integration could also lower system development and operating costs. An integrated EBT/POS network system could use the network of telecommunications facilities already established by commercial networks. To the extent that commercial POS networks have deployed POS terminals in Food Stamp Program-authorized retail outlets, integration with these networks would also lead to lower terminal deployment costs.

Even if terminals had not been deployed prior to implementation of an EBT system, terminal deployment costs in an integrated EBT/POS system would lead to lower costs if retailers opted for deployment of terminals which could process commercial as well as EBT transactions. Under this approach, terminal-related costs could be shared by the government and private sectors. The actual allocation will depend on a variety of factors, such as special Food Stamp requirements for terminals and transaction processing, the frequency of equipment use by food stamp and non-food stamp shoppers, and the relative cost-effectiveness of terminal deployment for public and private sector groups.

Vendor or Agency Authorization. In selecting an EBT system design, State Agencies need to decide whether they or outside vendors will operate the system. Options range from nearly complete Agency operation (as in the extended Reading EBT demonstration) to nearly complete vendor operation (as in the State-initiated EBT demonstrations). State Agencies would remain responsible for issuance file creation even in the latter approach.

If the vendor is responsible for all major operations except issuance file creation, it will acquire and authorize EBT transactions, switch non-EBT transactions to other authorizers if the system is integrated with a

commercial network, and settle the system. An example of this "vendor authorization" model is diagrammed in Exhibit 2-2. Like the hypothetical network shown in Exhibit 2-1, the vendor (as the network switch) accepts transactions from multiple acquirers. Each acquirer in the diagram performs authorization services for two card-issuing institutions. The vendor also drives terminals at two retail locations, acquiring all transactions (EBT and non-EBT) initiated at those locations.

In addition to acquiring and receiving transaction messages, the vendor routes some transactions to those card-issuing institutions which perform their own authorization services (i.e., Institutions 5 and 6 in the diagram).

Instead of routing EBT transactions to the State Agency for authorization, the vendor maintains the EBT Client Authorization File (CAF) and authorizes (or rejects) all EBT transactions. The linkage between the vendor and the Agency represents the passing of issuance and other administrative data which update the CAF.

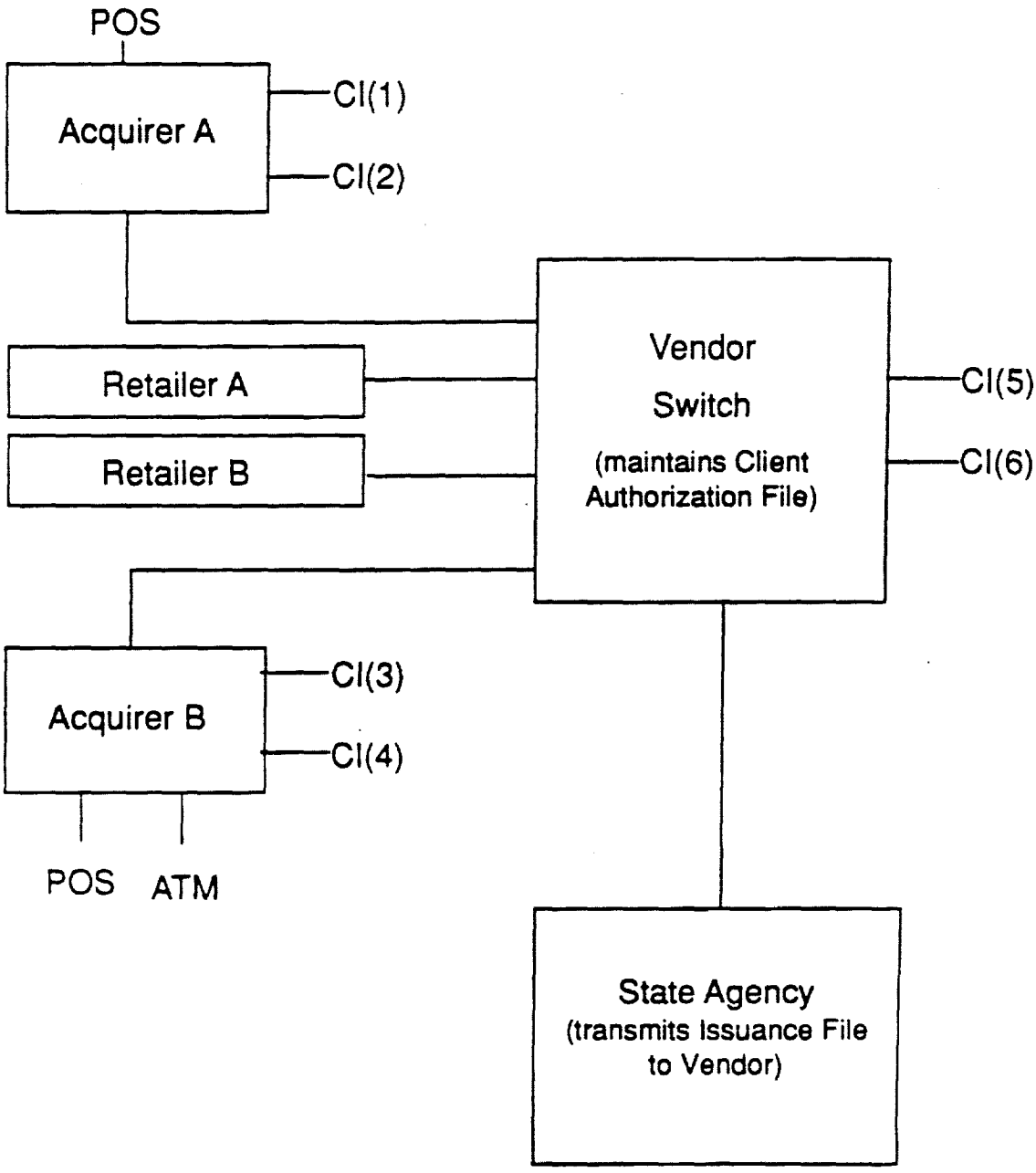
The vendor and acquirers will perform all retailer EBT settlement activities in the Vendor Authorization model, including reconciliation and posting.

A very possible variant on this model is for the State Agency to contract with a participating financial institution or an acquirer for EBT authorization services. In this situation, the switch would route all EBT transactions on to the financial institution or the acquirer. The financial institution or acquirer would maintain the EBT Client Authorization File, and the State Agency would transmit all issuance files to this institution for posting. Thus, the Agency's system operating responsibilities remain exactly the same regardless of which organization--the network operator, a financial institution, or an acquirer--authorizes EBT transactions.

The Vendor Authorization model should be differentiated from existing POS network models in which the network performs "stand-in processing." Stand-in processing refers to a switch operator's ability to process a financial institution's POS activity for a temporary period when data processing problems at the financial institution prevent on-line, real-time authorization. With stand-in processing, the financial institution transmits either a "positive" file or a "negative" file each day to the network. (A positive file is a listing of all the financial institution's debit-card

Exhibit 2-2

VENDOR AUTHORIZATION MODEL



accounts for which POS activity is to be authorized; a negative file is a listing of accounts for which authorization should not be provided.) When the switch receives a transaction request requiring stand-in processing, it checks the positive or negative file and either authorizes or rejects the transaction accordingly.

Two features distinguish stand-in processing from the Vendor Authorization model. First, stand-in processing does not involve a check against the cardholder's current balance. If stand-in processing results in an overdrawn account, the financial institution assumes liability for any excess debits authorized against the account. Second, stand-in processing is used only as a temporary measure to ensure that cardholders can use the system even when a financial institution cannot authorize transactions. In contrast, the Vendor Authorization model assumes that the vendor authorizes all EBT transaction activity for the duration of the vendor's agreement to provide authorization services.

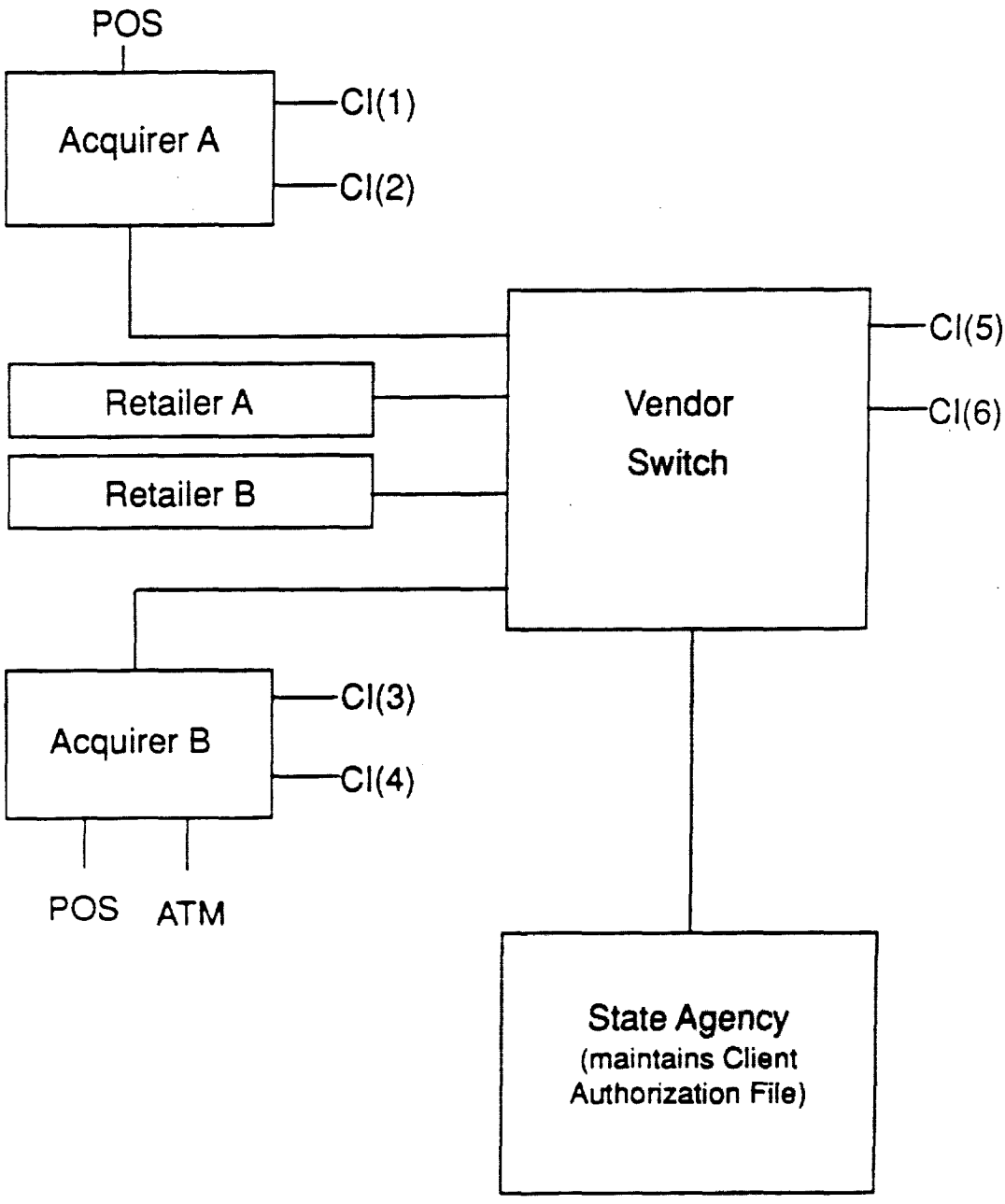
An alternative system design is the "agency authorization" model diagrammed in Exhibit 2-3. In this model the State Agency has transaction authorization responsibilities identical to those of card-issuing institutions 5 and 6. That is, all EBT transactions are routed by the vendor to the Agency's data processing center for authorization. The Agency maintains the Client Authorization File containing recipients' remaining balance information. After checking a recipient's remaining balance, the Agency sends the authorization message (either authorizing or rejecting the requested transaction) back to the vendor, which relays the message back to the retailer's POS terminal.

In the Agency Authorization model either the Agency, the vendor, or the individual acquirers in the network could maintain the Retailer EBT Participation File. In most cases, acquirers maintain such files to avoid sending unnecessary traffic through the network. In a large network with many acquirers, however, it may be difficult to ensure that all acquirers have received and properly processed information updating the Retailer EBT Participation File. Thus, to avoid authorizing EBT transactions initiated at unauthorized stores, the Agency may need to maintain the participation file.

In the Agency Authorization model the vendor, the Agency, acquirers, and the other financial institutions must maintain information for network settlement and retailer posting at the end of the day. Acquirers will main-

Exhibit 2-3

AGENCY AUTHORIZATION MODEL



tain all information on EBT and non-EBT credits owed to retailers. The vendor (as network switch) will keep track of total amounts to be received from the Agency and from each card issuer to cover retailers' credits. The Agency and each card issuer also maintain totals for funds they must provide to the network to cover those POS transactions authorized during the day.

The capability to reconcile between the various components of the network ensures the overall balancing of system accounts. On-demand balancing between all network participants ensures that a proper accounting is completed daily. Hence, the retailer balances with its acquirer via an on-line settlement transaction, and each card issuer (including the Agency) balances with the switch at a given time in the day. Reconciliation of POS detail transaction deposits to the daily on-demand balancing completes the balancing of the entire network, with retailers being credited for all activity and card issuers being correspondingly debited. Each card issuer must balance internally (i.e., its record of authorized transactions must match the switch's record of required funds for settlement).

For the Agency Authorization model, the State Agency must develop the data processing capabilities to maintain the EBT Client Authorization File (and perhaps the Retailer EBT Participation File) and to accept and process EBT transactions in an on-line, real-time processing environment. This will require special software and, perhaps, new processing and telecommunications hardware if these resources are not already available in the State Agency's data processing department.

Other design models are possible. For instance, the State Agency could act as a transaction acquirer, authorizing all EBT transactions and sending non-EBT transactions to the vendor. To do so, however, the Agency would have to develop or acquire greater data processing capabilities, and it would be directly responsible for settling retailer accounts. In general, such an approach would be cost-effective only if the Agency could defray operating costs by charging retailers and card-issuing institutions for all non-EBT transactions it acquired. Because this would put the Agency in direct market competition with commercial acquirers, this approach is unlikely to be endorsed by Federal or State authorities.

Manual Back-Up Procedures. A special program requirement of an EBT system is that Food Stamp Program recipients have access to their benefits

even when the EBT system or deployed terminals are not working. Design responses to this requirement, however, could vary in the Multiple Design approach. Some States could follow the Reading model of requiring manual authorization for all such sales, with each authorization involving a check of the recipient's current balance. Other States might require authorization for the sale, but without a check on remaining balances. Maximum purchase or daily limits for manually authorized sales could vary by State. Finally, different technologies could be used to grant authorization, ranging from a telephone call to hotline staff (as in Reading) to use of an Audio Response Unit (ARU).

If FNS wanted to avoid the risk of overdrafts inherent in some of these design options, it would have to provide greater detail in the system's special program requirements. Alternatively, FNS could require that if manual sales authorizations did not include a check on the recipient's remaining balance, FNS would not assume liability for purchases made with insufficient balances.

Hardware and Software. Even if EBT system designs were similar in all operational aspects, they could be based on different hardware, software and telecommunications configurations. State Agencies and their vendors, for instance, could base their designs on existing POS software packages (suitably modified to meet functional and special program requirements for an EBT system), or they could develop their own software from scratch. Telecommunications configurations could use different line transmission speeds, message protocols, error-checking routines and technologies. Any one of a number of different commercial POS terminals could be used.

The Possibility of Interchange Among States

For a transaction request to be processed in the POS direct debit industry, information about the request must be processed by both the institution acquiring the transaction (usually the terminal deployer) and the institution which issued the debit card. Specifically, the card-issuing institution (or its agent) must authorize or reject the request (and debit the customer's account if the transaction is authorized), and the transaction acquirer must credit the merchant's account if the transaction is authorized.

When the same institution both issues cards and acquires transactions, the above processing can be done directly. All pertinent information needed for processing is available to the institution. If the two institutions are different, however, a mechanism for transmitting the information between the institutions is needed. In addition, the information must be interpretable to both institutions. Finally, a mechanism for transmitting funds between the card user's account and the retailer's account must be in place. This process of transmitting information between institutions and processing that information is called "interchange." The POS industry has developed elaborate and detailed procedures for effecting interchange in recent years, including the establishment of switches whose primary role is the accurate routing of transaction and settlement messages between acquirer and issuer.

In an EBT system, interchange would allow Food Stamp Program recipients in one State to access their benefits in a store participating in another State's EBT system. Such interchange would give program recipients the flexibility of using program benefits that they now have in the coupon-based issuance and redemption system. That is, program recipients can now use their food stamp coupons at any program-authorized retailer outlet, regardless of that store's location.

Before interchange can occur between two States' EBT systems, a number of system design features must be coordinated. First, the POS terminals in each system must be able to read information contained on access cards issued by the other system. This requires consistency in card information and its location on the card. Second, the EBT databases maintained in both States must be capable of receiving and transmitting messages to a switching facility. Third, the information and format of the messages (including data encryption procedures) must be consistent, or the information sent and received by the other party will not be interpretable. Fourth, both States must reach agreement on standardized procedures for settlement of funds and reconciliation of transactions. Fifth, agreement must be reached on how errors will be handled and the locus of liability when errors occur. Finally, arbitration procedures must be in place. To facilitate interchange in commer-

cial POS networks, the American Bankers Association (ABA) has developed guidelines for all these design and procedural features.[1]

In the Multiple Design approach to developing a nationwide EBT system, no assurance exists that interchange among States would be possible. If each State has the option of designing its own EBT system, nothing prevents each State from developing its own procedures for card information, message formats and content, and the like. Even if these features were identical between two States, there is no requirement that the individual States develop the communications linkage (e.g., through a switch) necessary for interchange.

One real disadvantage of the Multiple Design approach, therefore, is the lack of an assured interchange capability with other States. The severity of this disadvantage would be most apparent in States where large metropolitan areas lie on State borders. If program recipients in these areas are currently accustomed to crossing State borders while shopping for groceries, lack of interchange would require a substantial change in shopping patterns.

It is important to note that interchange cannot be achieved in the Multiple Design approach by simply adding it as a functional or special program requirement for an EBT system. For interchange to occur, there must be design requirements similar in scope and detail to the ABA guidelines and negotiated agreements among the operators of individual EBT systems.

"STANDARDIZED DESIGN" APPROACH TO DEVELOPMENT

The "Standardized Design" approach to developing an EBT system with nationwide coverage is similar in many respects to the Multiple Design approach. Under the Standardized Design approach, FNS would specify functional and special program requirements for each EBT system. System performance standards might also be specified. In addition, the Standardized Design approach again leaves the initiative for developing an EBT system to each State Agency.

Unlike the Multiple Design approach, however, FNS would specify some required design parameters in the Standardized Design approach. The amount of

[1] Guidelines for Online Debit Card Systems at the Point of Sale, American Bankers Association, Washington, D.C., 1987.

standardization required, of course, is a decision which FNS must address. In making this decision, FNS must decide which design parameters are of sufficient importance to a nationwide EBT system that Federal restrictions on design flexibility are warranted. Reasons for restricting design approaches could arise from several objectives FNS might pursue:

1) ensuring the availability of interchange,

2) ensuring the compatibility of a State's EBT system with commercial POS and ATM networks,

3) protection of program and system integrity beyond that which can be gained with functional or special program requirements,

4) protection of recipient and retailer interests beyond that which can be gained with functional or special program requirements, and

5) improving the cost effectiveness of each EBT system.

Ensuring the Availability of Interchange. If FNS wants interchange to be available in a nationwide EBT system, it must specify that each State's system design be standardized with respect to those elements included in the ABA guidelines for POS direct debit systems. Examples include the content and location of information encoded on the access card's magnetic stripe (so terminal card readers in one State can read information on cards issued by another State) and the content and format of transaction authorization messages (to enable one State's processor to interpret messages generated in another State).

To ensure cross-State interchange in an EBT system, it is not necessary that FNS specify the same standards recommended by the ABA, only that the standards cover the same design elements. Given the existing work on standardization which has occurred within the commercial POS industry, however, it seems unlikely that any government agency would adopt a wholly different set of standards. The existing industry standards have evolved from many years of commercial operations, and they ensure efficient and reliable processing of interchange transactions. If a different set of standards was specified by FNS, the resulting nationwide system would necessarily have to be a "stand-alone" system. That is, the system could not be integrated with existing commercial systems.

An area in which FNS might want to elaborate on existing standards is for manual back-up transactions. In cooperation with industry representatives, FNS could specify procedures which would allow interchange to occur even if a terminal was not working or one of the two systems was otherwise unavailable.

Ensuring Compatibility with Commercial POS and ATM Networks. Compatibility can best be achieved by adopting the design guidelines issued by the ABA. The ABA guidelines are also consistent with technical standards issued by the International Organization for Standardization (ISO) and the American National Standards Institute (ANSI). These latter standards cover the use and format of a cardholder's Primary Account Number (PAN); physical characteristics of the access card; content and format of encoded information; message formats; information codes; PIN generation, assignment, delivery and issuance, and replacement; PIN pad key layout; and PIN encryption and verification procedures. Where the guidelines go beyond the ISO and ANSI standards, the guidelines have been submitted to ISO and ANSI with a request for development of standards.

It should be noted that most commercial POS networks do not fully conform to the ABA guidelines, especially in the areas of message formats and which types of transactions they can process. While this incompatibility does not preclude interchange, it makes interchange much more difficult to achieve. To facilitate future interchange efforts, many networks are adhering to these guidelines as they upgrade their equipment and redesign their systems.

Protecting System Integrity. Many factors affecting system and program integrity can be controlled through detailed functional and special program requirements. Examples include requiring (1) verification of the card user's identity, (2) verification that messages from a POS terminal are being transmitted from a program-authorized retailer, (3) reconciliation of benefits posted to a recipient's EBT account, (4) reconciliation of daily transactions against changes in recipient account balances, and (5) restriction of physical and telecommunications access to the system.

If detailed functional and special program requirements cannot adequately ensure system integrity, design standards dealing with system security could be imposed. These standards could entail some of the provisions included in Federal requirements for computer and automated data

processing (ADP) security.[1] Furthermore, they need not be limited to the design of system hardware and software. System operating procedures, periodic security reviews and audits, and training of system operators and participants could also be covered in system "design" requirements.

Protecting Recipient and Retailer Interests. As with protection of system integrity, recipient and retailer interests can be protected in large part by the functional and special program requirements which FNS specifies for an EBT system. The functional requirements for crediting retailers can specify within how many days a retailer must receive credit for an EBT sale. Requirements for retailer and recipient training are intended to help both groups of participants as well as to promote efficient and accurate usage of the system.

Any system performance standards which FNS imposes on an EBT system are also designed to consider the interests of retailers and recipients. These standards might cover maximum response times at the POS terminal, maximum times for vendors to repair or replace faulty store equipment, and maximum allowable periods of system downtime, as well as other features of system performance. A separate report prepared for FNS, for instance, recommended a maximum period of system unavailability of 0.5 percent and a maximum time until equipment repair of 3 hours.[2]

Despite the above requirements which help to protect recipient and retailer interests, detailed design standards also can act to improve service to all participants. Certainly, any design specifications meant to allow interchange among States' EBT systems further protect recipient and retailer interests. Detailed standards of how manual authorizations are to be performed can eliminate procedures which are difficult to implement at the checkout counter. As another example, if the current or future EBT demonstrations show that either on-line or off-line EBT systems best protect retailer and recipient interests, FNS could specify that an EBT system incorporate one or the other technologies.

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[1] These requirements are reviewed in Chapter 6.

[2] John A. Kirlin, Performance Standards for Electronic Benefit Transfer Systems, Cambridge, Massachusetts: Abt Associates Inc., September 1987.

Improving Cost-Effectiveness. Cost-effectiveness is a major goal in the development of an EBT system. In striking a balance between cost-effectiveness and other objectives (e.g., system security, ease of use), FNS may determine that some system designs best meet these competing requirements.

System operating costs, however, are not the only component of a system's cost-effectiveness. The costs of system design, development and implementation also must be considered. At first glance, one might think that the Standardized Design approach to implementing a nationwide EBT system would necessarily be more cost-effective than the Multiple Design approach. After all, by restricting design choices, FNS would reduce State Agency and vendor time spent considering other design options. In addition, once a system vendor developed an EBT system for one State, much of the development effort for other States would already be completed.

These factors might indeed reduce overall design and development costs. Even with the Standardized Design approach, however, substantial work may be needed in each State to develop the interface between the vendor and the State Agency's data files. Indeed, in some States the design restrictions could increase this required effort if an alternative design approach would be simpler to implement. It is also possible that the Standardized Design approach could reduce competition among vendors. Vendors with existing POS

[redacted]

requirements would force them to substantially modify their existing software or hardware. Limiting competition could increase both development costs and subsequent operating costs. Restrictions on system design could also prevent some vendors from submitting a design which would be most cost-effective for a particular State, even if it was not the most cost-effective design for other States.

develop and operate (with the assistance of one or more vendors) a national (as compared to nationwide) EBT system.

A Unitary EBT system could involve either centralized or regional authorization of EBT transactions. In a centralized system, one vendor would be responsible for maintaining an EBT database that contained records for every food stamp recipient being served by the system. All EBT transaction messages would be transmitted to this vendor's processing center for authorization. Conceptually, the messages could be transmitted directly from POS terminals to the national processor, but the more feasible approach would be for messages to funnel to the processor through existing network switches. After checking the requested purchase amount, the recipient's remaining food stamp balance and the retailer's program authorization, the national processor would send an authorization or reject message back to the POS terminal (again, either directly or through switching facilities).

The national processor would settle each day's activity by processing that day's transactions and initiating a funds transfer from the U.S. Treasury to retailers' depository institutions.

In a regional system, a single processor within each region would be responsible for maintaining the EBT database for all food stamp recipients within the region participating in the EBT system. In general, each regional processor would perform all the functions that the national processor performs in the centralized version of this approach. The major difference is that, in order to allow full interchange, each regional processor would have to act as a switch, routing transaction messages to (and accepting messages from) another regional processor when recipients crossed regional boundaries and wanted to access their food stamp benefits.

In either a centralized or regional version of the Unitary Design approach, State Agencies would be responsible for sending EBT issuance authorization files to the central or regional processor. The vendor operating the processing center would need to specify one or more allowable formats for issuance files, and the Agencies' data processing centers would have to modify their software to provide the issuance files in the designated format.

As with the other development approaches, State Agencies would still need access to the EBT database for administrative functions (e.g., setting up accounts, checking balances, placing holds on accounts when cards are reported as lost or stolen). With a national or regional processor, however, more uniformity in allowable administrative functions and methods would need to be imposed across the States served by the processor. Similarly, management reports on activity by a State's participants would necessarily be more uniform, given the common structure of the EBT database. Some tailoring of a State's management reports would be possible (within the constraints of the database), although this would increase development costs and, perhaps, operating costs.

The Unitary Design approach will facilitate the reporting of EBT system activity to FNS' national headquarters and the Regional Offices. Instead of receiving many different reports (possibly containing different information in different formats), FNS could receive reports from a national processor which summarize activity by State, by FNS Region, and for the entire system. In the regional version of the Unitary Design approach, the individual regional processors could submit reports in a standard format, or they could transmit summary information to one of the regional processors for data compilation and report generation.

One potentially difficult aspect of the Unitary Design approach is retailer recruitment and management. In the Multiple and Standardized Design approaches, each State (or its vendor) would be responsible for: recruiting retailers for the EBT system, deploying and maintaining terminals, training retailers, acquiring and authorizing EBT transactions, and effecting settlement. Responsibility for these tasks is therefore spread across many organizations. In the Unitary Design approach, the national or regional vendors will be responsible for retailer recruitment and management. Even though these vendors might subcontract with local institutions (e.g., banks, existing POS networks, and service vendors) for retailer recruitment, training, terminal deployment and maintenance, the national or regional vendors would have final responsibility for seeing that these tasks were completed. This centralization of responsibility adds a layer of required management and supervision not found in the Multiple and Standardized Design approaches.

2.4 PARTICIPANTS IN A NATIONWIDE EBT SYSTEM

In considering the feasibility of a nationwide EBT system (regardless of which development approach might be followed), it is necessary to understand that a large number of different institutions, recipients and retailers will be impacted by implementation of such a system. This section identifies these groups and discusses how each group's activities would differ according to which development path is followed.

FOOD STAMP RECIPIENTS

Nearly all Food Stamp Program households receive benefits in the form of food stamp coupons. Recipients can use these benefits at any program-authorized store, regardless of location. Furthermore, the coupons have no expiration date. Once issued, they can be used at any time, even after the household becomes ineligible for further program participation.

With the introduction of an EBT system, all food stamp benefits issued to each household participating in the system would be accessible only through the EBT system. If some currently authorized retailers decided not to participate in the EBT system, households' use of benefits would be somewhat more restricted than at present. The extent of restriction, of course, would be directly related to which stores within each market area decided not to participate in EBT. If interchange with other States' EBT systems was not possible, use of benefits would be further restricted. This would primarily affect recipients living near State borders. These restrictions on where EBT benefits could be used would be alleviated if EBT benefits could be converted to coupons. The extent of the restriction would depend on policies regarding when and under what circumstances conversion would be allowed.

Recipients participating in an EBT system would need training in how to use the system, an aspect of participation that exists in the coupon-based system to a lesser degree.

Recipients' interactions with an EBT system may differ depending upon which development path is selected. For some recipients, use of benefits would be less restricted if interchange was possible, a design factor not likely to be incorporated in the Multiple Design approach. The Multiple

Design approach is also most likely to result in differences across States in how recipients use an EBT system. The most dramatic difference would occur if some States selected an off-line system design while others implemented on-line EBT systems.

PROGRAM-AUTHORIZED RETAILERS

Program-authorized retailers accept food stamp coupons in lieu of cash from program recipients. Retailers receive cash credit for the coupons when they deposit the coupons, along with Redemption Certificates, at their financial depository institutions. The Redemption Certificates specify the store's name and deposit amount and are used by FNS in monitoring stores' redemption volumes.

With the implementation of an EBT system, participating retailers must accept the installation of EBT equipment (i.e., POS terminal, PIN pad and printer) at all or some of their checkout stands. Checkout clerks and management personnel must be trained in how to use the POS equipment. Store managers (or designated personnel) must also follow special procedures for reconciling food stamp sales with receipts. Instead of counting coupons to balance the cash drawer, the store must match EBT sales with subsequent credits to the store's EBT account.

Store personnel will also need to learn appropriate procedures for initiating and reconciling manually authorized sales. Such sales are necessary when system or store equipment malfunctions prevent the electronic authorization of EBT sales.

If all food stamp recipients are not served by an EBT system, some retailers will continue to handle food stamp coupons as well as EBT transactions. If retailers elect not to participate in an EBT system, they might lose whatever business had been generated by recipients participating in the EBT system, depending upon policies concerning the conversion of EBT benefits to coupons.

In general terms, the changes to retailer operations described above will not vary depending upon which development path is selected. For each development path, EBT equipment must be installed, retailers must be trained, back-up procedures must be available, and reconciliation of sales must be accomplished.

The details of how a retailer interacts with an EBT system, however, depend upon the selected design of the system. The most obvious difference is whether an on-line or off-line system is implemented. A second issue is whether the EBT system is compatible with existing commercial debit card operations. Other design choices affecting retailers include which programs are incorporated into an EBT system (e.g., will retailers be asked to provide cash to AFDC recipients using the system), the availability of ATM services for EBT recipients at retailer locations, the required procedures at the POS terminal, procedures for authorizing manual sales, and how settlement is done. Finally, the system's performance (which is affected by system design) will have major consequences for retailers.

Although the design of an EBT system within a given State may vary depending upon which development path is selected, one cannot say with certainty that one development path will be more advantageous to retailers than another. As described below, however, the choice of development path can affect selected groups of retailers.

It is likely that the speed of system implementation will vary according to the selected development path, although it is not clear which development path would lead to the quickest start-up of an EBT system within a given State. Under the Multiple or Standardized Design approaches, some States might be ready to implement an EBT system within a couple of years. Other States might not implement an EBT system for a decade or longer, if ever. If the Unitary Design approach were selected, it is likely that some States' EBT efforts would be delayed while they wait for the system to be implemented. For those States not currently considering an EBT system, however, the existence of a Unitary system might speed local efforts to tie into the existing system.[1]

It is also possible that large retail chains would prefer the Unitary Design approach, or at least the Standardized Design approach over the Multiple Design approach. For chains with stores in more than one State, management would probably prefer as much uniformity as possible in EBT operations across States.

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[1]A discussion of individual States' interest in EBT systems is presented in Section 7.2.

FINANCIAL INSTITUTIONS

Financial institutions now accept food stamp coupons like cash for deposit by food retail customers. After processing the paperwork associated with these deposits, they send the coupons to a Federal Reserve Bank (or a correspondent bank which, in turn, sends the coupons to the Federal Reserve) for credit to their account. Some financial institutions also act as coupon issuance agents for State Agencies.

With an EBT system, financial institutions will receive fewer (or possibly no) coupons from their retail food customers. Retailers' EBT credits will be transmitted electronically to the institution, possibly through the Federal Reserve's Automated Clearing House (ACH) funds transfer system. To the extent that the volume of deposited coupons decreases, financial institutions will enjoy a reduction in the labor-intensive effort required to count deposited coupons and prepare the necessary paperwork for forwarding the coupons to the Federal Reserve for credit. Based on interviews with bank officials in Reading, most financial institutions will be happy to give up their role as coupon issuance and redemption agents.

Because the back-end settlement procedures for an EBT system will probably be quite similar regardless of which development path is chosen, we see no reason why banks would prefer one development path to another.

TRANSACTION ACQUIRERS

For the Multiple and Standardized Design approaches, State Agencies will have overall responsibility for deploying POS terminals in program-authorized stores. Unless an Agency operates its EBT system, however, it will not acquire the transactions. In addition, State Agencies have little or no experience dealing directly with retailers. We therefore assume that each Agency will contract with one or more vendors for terminal deployment and transaction acquisition. Alternatively, an Agency's system developer could handle terminal deployment and transaction acquisition, either directly or through subcontracting arrangements. In the Unitary Design approach, the national or regional vendors would be responsible for these tasks or for arranging the subcontracts.

It is possible that State Agencies or the national or regional vendors may run into some difficulties finding institutions willing to deploy terminals and act as transaction acquirers for EBT transactions. To understand the potential difficulty, one must understand the business incentive to participate in a POS system.

When financial institutions or other vendors deploy POS terminals in retail outlets, they incur costs for the following activities:

1) contact and convince retailers to accept POS equipment,

2) negotiate contracts with the retailers,

3) purchase and install the POS terminals and equipment,

4) maintain the terminals and equipment,

5) acquire POS transactions,

6) either process the POS transaction or route it to the transaction authorizer,

7) settle each terminal at the end of each business day, and

8) periodically bill the retailer for all recurring costs in the negotiated contract (e.g., lease costs, service costs, transaction fees).

These costs are recovered in the recurring charges to the retailer, in transaction acquisition fees paid to the acquirer when cardholders from another institution use the terminal, and possibly in fees charged to its own cardholders when they initiate POS transactions. The financial institution also enjoys the benefits of building a more diverse business relationship with both the retailers and its cardholders. This relationship may lead to the delivery of other profitable business services, as well as the use of funds held in depositors' accounts.

In an EBT environment, a financial institution (as terminal deployer/transaction acquirer) loses some of the benefits described above. Because all program-authorized retailers need terminals, the financial institution will need to deploy terminals in many stores where other business prospects may be limited or not valued by the financial institution. In addition, because program recipients will not be bank customers, there is no opportunity for collecting fees from the recipients and little incentive to

try to draw the recipients into a customer relationship. Instead, the financial institution will have to negotiate a contract with the State Agency or the system developer that covers all costs except acquisition and settlement fees. These latter fees will be billed to the system operator and, in turn, will become part of the vendor's fee to the State or FNS for providing EBT processing services.

The above discussion is not meant to suggest that finding local institutions to deploy terminals will be impossible. The important point to recognize is that the business case for deploying EBT-only terminals in an EBT system is different than deploying POS or integrated EBT/POS terminals. Terminal deployers may not see the same business advantages to deploying EBT-only terminals. As such, they may be less likely to contract for these services, or they may require higher reimbursement for the services they do provide. To the extent that terminal deployers can install a mix of EBT-only and EBT/POS terminals, of course, potential future benefits accrue to the deployer, and it should be easier to find institutions willing to deploy terminals.

STATE WELFARE AGENCIES

Once a Federal decision is reached to expand EBT systems beyond pilot demonstrations, State Agencies will play a key role in the implementation of any EBT system, regardless of the development approach taken. As described below, however, their role under the Multiple Design and Standardized Design approaches is somewhat different than under the Unitary Design approach.

In either the Multiple or Standardized Design approaches, the State Agency makes the initial decision about whether or not it wants to use an EBT system to issue and redeem program benefits. Once the decision to implement an EBT system is reached, the Agency is totally responsible for managing the design, development, implementation and operation of the entire system. System design and operation, of course, must conform to any functional, special program, performance or design constraints imposed by FNS.

Most, if not all, State Agencies will enter into contracts with one or more vendors to design, develop, implement and operate their EBT systems. Some States could opt instead for turnkey systems which they would operate, or

even decide to manage system design and development themselves. As in Pennsylvania, however, vendor support is likely to be needed for some tasks. Regardless of the detailed approach to development, the vendors will be selected by the State Agency.

In the Unitary Design approach, each State Agency again makes a decision about whether or not to implement an EBT system. In this approach, however, the EBT system will be integrated with the national system. To achieve this integration, the Agency will have to enter into a contract with a vendor selected by FNS.

The State Agency's interaction with the regional or national vendor will have to cover the following functions:

- sending issuance authorization files to the vendor,
- accessing the vendor's database to perform administrative functions,
- settling EBT debits involving State-provided benefits, and
- receiving and reviewing summary reports on system activity.

Although each of these functions also occurs in the Multiple and Standardized Design approaches, implementing these functions in the Unitary Design approach will be different, as described below.

Issuance Authorization Files

In each development approach, the State Agency will have to pass information about new accounts and benefit authorizations to the vendor. In the Unitary Design approach, however, the format may be pre-defined by the vendor. Although the vendor may be able to modify its format requirements to meet local needs, the range of possible formats will probably be more limited than in the Multiple or Standardized Design approaches. The vendor's database design may restrict format choices because the regional or national vendor has to accept other States' issuance authorization files as well.

Accessing the Vendor's Database

The EBT vendor will be responsible for maintaining the client database. Each local office will have to be able to access this database to perform administrative functions like card or account set-up, history and balance inquiries, and "hotcarding" lost or stolen cards (to prevent unauthorized use of the card). Again, because the vendor in the Unitary Design approach will have a database that encompasses more than one State's EBT population, the vendor will impose some uniformity on database structure and content. This means that the State Agency will have less flexibility in designing database access and functions than in the Multiple and Standardized Design approaches.

Settlement

For cash assistance programs whose benefits are funded partly or totally from State treasuries, the EBT vendor will need to access these funds during each day's settlement of the State's EBT system. In an effort to streamline its back-end settlement activities, the vendor in the Unitary Design approach may restrict somewhat the different methods for achieving this aspect of integration. While the vendor may not need to impose identical settlement procedures on all States, it is probably correct to assume that design flexibility for this aspect of system operations will be more limited than under the Multiple and Standardized Design approaches.

Summary Reports

The vendor will provide the State Agency with periodic reports summarizing all financial and administrative activity related to the State's EBT participants. While the State Agency and the vendor will have some opportunity for negotiating the content and format of these reports, report content will be directly influenced by the structure of the vendor's databases and processing system. Thus, once again, a State Agency will not have as much flexibility in defining report content and format in the Unitary Design approach as in the other development approaches for an EBT system.

LOCAL WELFARE OFFICES

Nearly all interaction between Food Stamp Program staff and program recipients occurs at local welfare offices. Throughout the United States, there are approximately 3,600 such local offices.

The introduction of an EBT system will have little effect on certification activities at local offices, but it will change issuance procedures. Instead of issuing checks for cash assistance programs and coupons (or coupon-authorization documents) for the Food Stamp Program, local offices will become involved with EBT card issuance, client training, and performing administrative updates to the EBT database.

In the current round of State-initiated EBT demonstrations, the project vendors are assuming responsibility for initial card issuance and recipient training. In one site, the vendor will also do card issuance and training after system implementation. In a Statewide EBT system, however, it seems more likely that local offices will assume card issuance and client training responsibilities, at least for ongoing operations. Of course, a vendor could assist in preparing a training curriculum and training materials.

Local welfare offices' general responsibilities in an EBT system will be the same regardless of which development approach is taken. In the Multiple and Standardized Design approaches, however, State Agencies will have more flexibility in designing how local offices interact with the system for administrative functions. This design flexibility could allow the introduction of more cost-effective administrative procedures than under the Unitary Design approach.

FOOD AND NUTRITION SERVICE

The implementation of any nationwide EBT system will require major changes in FNS' administration of the Food Stamp Program. As might be expected, the greatest changes occur if the Unitary Design approach is selected.

Multiple Design Approach

Before the Multiple Design approach to system development can be implemented, FNS must change existing Food Stamp Program regulations and

specify the functional and special program requirements the State-initiated systems must meet. FNS may also want to specify performance requirements for EBT systems.

Once States begin initiating their EBT systems, FNS will need to monitor development and implementation activities and ongoing system operations. At a minimum, FNS will have to review system designs to ensure that all functional and special program requirements are met. FNS also may want to monitor system testing and implementation, although this could be left as a State Agency responsibility. Once a system is operational, FNS would need to provide the same type of oversight as is currently performed for States' coupon issuance systems. Due to the greater number of functions performed by an EBT system and the number of systems involved, however, the amount of oversight needed would increase. For instance, benefit redemption, settlement and reconciliation would have to be separately monitored for each State system, whereas in the coupon system many of these functions are centralized within the banking system (the Federal Reserve being the primary point of contact with the U.S. Treasury and FNS). In addition, the FNS field offices would need to transmit retailer authorization information to the States (or their vendors), a task not present in the coupon system.

Unless the State-initiated EBT systems completely eliminated paper coupons, FNS would still remain responsible for all coupon-related activities and management currently being performed. Because the level of coupon issuance and redemption would be reduced, however, the management effort also could be reduced.

Standardized Design Approach

FNS' responsibilities for a nationwide EBT system remain virtually the same under the Standardized Design approach as under the Multiple Design approach to development. The major difference is that FNS must also decide which design features of the States' EBT systems are to be standardized.

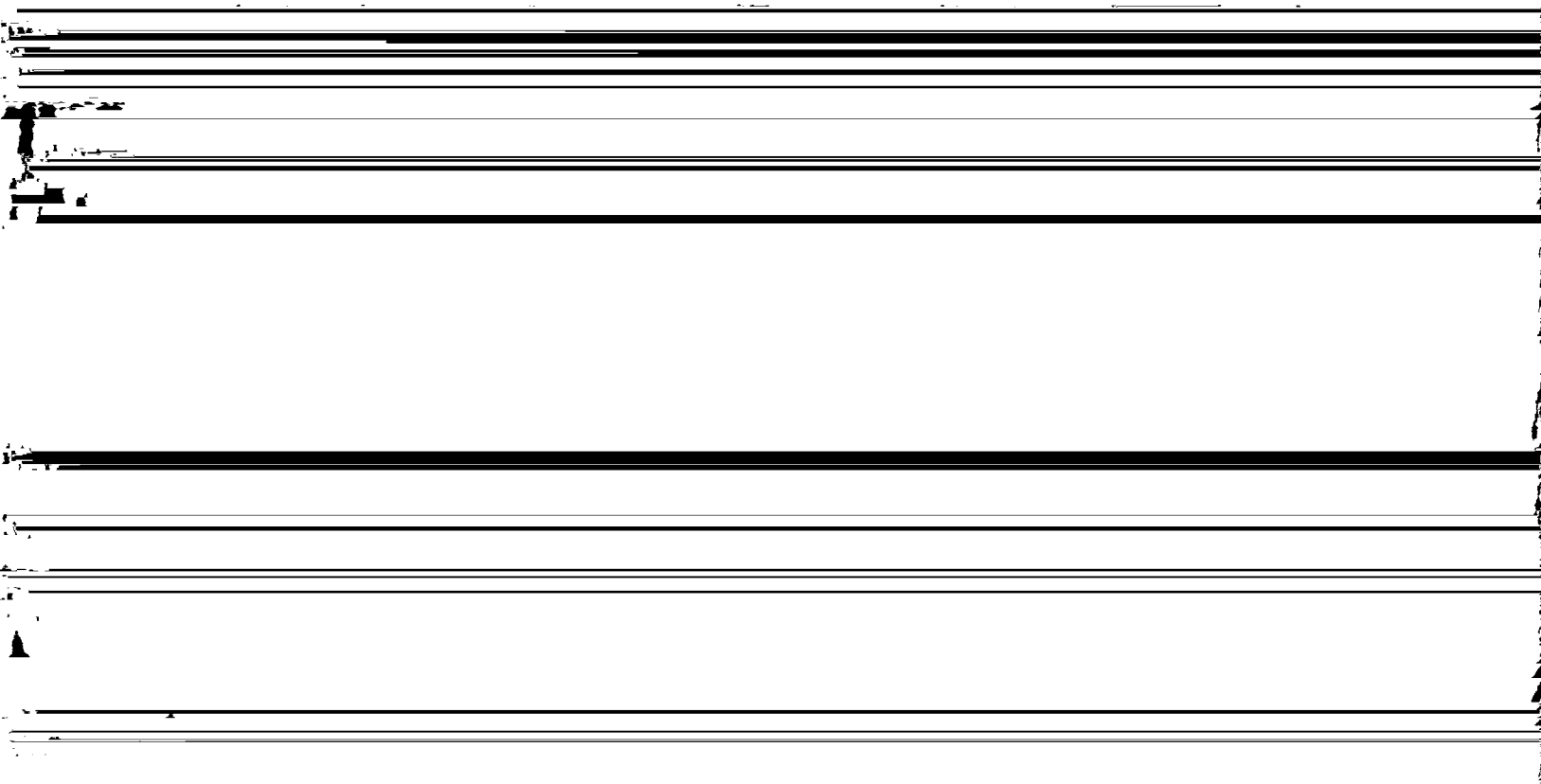
As in the Multiple Design approach, FNS will need to review proposed system designs to ensure compliance with functional and special program requirements. Compliance with specified design requirements will also need to be monitored. This review process is likely to require somewhat more effort on FNS' part, especially if interchange with other States' EBT systems is anticipated.

Unitary Design Approach

In the Unitary Design approach, FNS must take the initiative to procure the services of one or more vendors to establish the basic infrastructure of the national EBT system. Early in the procurement process, FNS must decide whether a centralized or regional system is most advantageous. It will also have to decide which basic system design (e.g., on-line, off-line, or some combination) is most suitable for a national EBT system.

The choice of a centralized or regional Unitary system may not rest solely on technical or initial cost considerations. If a single vendor is selected to operate a centralized EBT system, it may be quite costly to change vendors in the future. If a number of vendors are selected to operate regional systems, it probably will be easier (and less costly) for one of the vendors to assume responsibilities for another vendor if that region's vendor either goes out of business, decides not to renew its EBT contract, or increases its prices substantially at contract renewal. Of course, with multiple vendors, FNS will need to spend more time each year on contract management than if a single vendor is selected.

In some respects, FNS' interactions with State Agencies will be less under the Unitary Design approach than under either the Multiple or Standard-



designs, and most system management information will be provided directly by FNS' vendor(s) rather than by the States and their vendors. Because State

Another reason for recruitment efforts by FNS is that total costs per case may decline as more recipients are placed on the system. Whether or not costs decline will depend largely on the nature of the contracts with the national or regional vendors. If the vendors offer discounted prices for larger transaction volumes, costs per case will decline as more States participate in the system.

2.5 OPERATING PARAMETERS OF A NATIONWIDE EBT SYSTEM

Because this report examines the feasibility of implementing a nationwide EBT system from different perspectives, it is useful to consider the general size of a nationwide EBT system. These operating parameters will help in anticipating what is involved in implementing and operating a nationwide EBT system.

PREPARING RETAILERS FOR AN EBT SYSTEM

Approximately 222,000 retail food outlets are authorized to participate in the Food Stamp Program. If one envisions a nationwide system with complete geographic coverage, POS terminals and related equipment (i.e., PIN pads, printers, telephone lines) need to be deployed at each retail site. Furthermore, store owners and staff need instruction on how to use the system.

If EBT equipment is to be installed at all checkout counters in each program-authorized store, approximately 577,200 direct debit POS terminals and related equipment would be needed. This estimate is based on an average of 2.6 checkout lanes per store.[1] By way of comparison, only 51,000 commercial debit card terminals are in use throughout the country.[2] The number of required EBT terminals could be reduced by using debit terminals deployed in food stores, but only about 20,000 such terminals have been deployed so far.

[1]The estimate of 2.6 checkout lanes per store reflects the number of stores and lanes in the Reading and State-initiated EBT demonstrations.

[2]Credit card networks have deployed about 800,000 credit card terminals nationwide, so a precedent exists for deployment of large numbers of debit card terminals. Chapter 4 addresses the possibility of using credit card terminals for debit transactions.

Three factors could help reduce the number of EBT terminals needing to be deployed. First, commercial networks could deploy more terminals in retail food outlets in the near future. Second, it might not be necessary to deploy terminals at every checkout counter.[1] Third, retailers with low food stamp sales volumes might be able to use regular touch-tone telephones to obtain authorization for EBT sales. Even with these factors, however, the number of terminals needing to be deployed would still be very high. Clearly, the magnitude of this effort cannot be underestimated.

With respect to training requirements, it is not unreasonable to expect an average of 60 minutes per store for on-site training. This translates into 222,000 total hours for retailer training. Assuming that one person could train employees at an average of four or five stores per day (allowing time for scheduling visits and travel between stores), about 50,000 days of training would be required. To train all stores within three years, one would need a team of about 70 instructors working full time.[2]

Training resources could be reduced if store managers and employees went to group training sessions. If group size were restricted to about 24 and an average of three people from each store were trained, however, nearly 28,000 training sessions still would be needed. Group participants would then train those employees who did not attend the group training sessions.

Once all stores have been equipped and trained, there is a need for ongoing support as new stores are authorized. Evidence from the Reading demonstration suggests that the number of newly authorized stores each month equals, on average, about one percent of the existing retailer base. Thus, for a nationwide system with 222,000 program-authorized retailers, about 2,220 new stores would need EBT equipment and training each month. Some of the equipment could be taken from stores leaving the Food Stamp Program, thereby reducing additional equipment costs.

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[1]This issue is being examined in the State-initiated EBT demonstrations.

[2]"Full time" assumes five-day work weeks with eight holidays and two weeks vacation.

If an EBT system includes cash assistance participants, merchant participation need not be restricted just to Food Stamp Program-authorized retailers. Cash assistance recipients could access their benefits at any store electing to participate in the system. If non-food stores participated, terminal deployment and retailer training requirements would be greater than those listed above.

PREPARING CLIENTS FOR AN EBT SYSTEM

All program recipients participating in an EBT system need EBT access cards and training. There are approximately 7.05 million households participating in the Food Stamp Program and 3.77 million households participating in the AFDC program. About 80 percent of AFDC households also participate in the Food Stamp Program, and we assume that card issuance and training could be integrated for these households.

If all food stamp and AFDC households participated in an EBT system, about 7.8 million EBT cards would have to be purchased, encoded and issued to recipients. Assuming that these functions would be carried out at the nearly 3,600 local welfare offices in this country, the average office would have to issue approximately 2,175 EBT cards when that office converted to the EBT issuance system. Larger offices, of course, would have to issue many more cards.

Each month, approximately 390,500 new households are certified as eligible to participate in the Food Stamp or AFDC Programs (an intake rate of 5 percent). Thus, once all offices were participating in an EBT system, up to 390,500 new cards would need to be issued each month.[1]

With respect to training, if we assume that an average of 20 FSP/AFDC recipients can be trained in an hour (as in Reading), total training requirements at system start-up is about 390,500 hours. This averages to approximately 109 hours of direct training per local welfare office. An

[1]The actual number might be smaller, because many "new" recipients reapply to the Food Stamp Program after a short period of ineligibility. If these recipients retained their old cards, new cards would not need to be issued. Any reduction, however, is likely to be more than offset by replacements for lost, stolen or damaged cards (estimated at 3.5 percent based on data from the Reading EBT demonstration).

additional 10.8 hours per month would be needed at each office to train newly eligible recipients.[1]

PREPARING THE SYSTEM DATABASES FOR OPERATION

Before an EBT system can begin operations, four databases need to be created: a client authorization file, retailer files, a transaction log file, and a history file. These databases are described below.

Client Authorization File

As discussed in Section 2.2, information about recipients participating in an EBT system will be stored in a Client Authorization File. If one processor is responsible for authorizing all EBT transactions in a nationwide EBT system (i.e., the centralized version of the Unitary Design approach), that processor's CAF would contain 8.4 million records.[2] In the regional version of the Unitary Design approach, the average size of the CAF would be about 1.2 million records if processing were split among seven regional processors. In the Multiple and Standardized Design approaches, each State's CAF would reflect that State's caseload. For a combined AFDC/Food Stamp system, file size would range from as low as 11,000 (for States like Alaska, New Hampshire and Wyoming) to as high as about 800,000 (for States like New York or California).

Retailer Files

Transaction acquirers in an EBT system need to establish merchant and terminal control files to ensure that only transactions from program-authorized stores are routed to the EBT processor for authorization. These

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[1]The estimate of 10.8 hours per month assumes an average of 2.5 one-hour training sessions per week. This schedule should meet expedited service requirements and, with an expected average intake of about 109 cases per month, averages a manageable 10 clients per session. The intake volume of 109 cases per month is based on an EBT caseload of 2,180 and an intake rate of 5 percent.

[2]All estimates of the number of records in the CAF assume maintenance of inactive accounts for three months after a recipient leaves the Food Stamp or AFDC program.

files contain one record for each merchant served by the acquirer and one record for each terminal deployed in those merchant locations. Acquirers must also establish retailer account files for settlement.

Although the merchant, terminal and account files will need to accommodate records for at least 222,000 retailers and perhaps 577,200 terminals, these records will be divided across the files of a large number of acquirers. Thus, retailer files for any given acquirer need not be very large.

Transaction Log File

An EBT system also needs a transaction log file (TLF) for recording information about all transactions being processed by the system. As explained in the next section, the total number of POS and ATM transactions in a nationwide EBT system serving both the Food Stamp Program and AFDC would be about 72 million transactions per month. During days of peak transaction activity, the daily volume of POS and ATM transactions could exceed 6 million because benefit issuances (and use) are concentrated in the first two weeks of each month. This volume is very high. In 1989, for instance, total POS debit card volume in the U.S. was only about 13 million transactions per month. ATM volumes were much higher at 422 million transactions per month.[1] Thus, a nationwide EBT system with 72 million financial transactions per month would represent an increase of about 17 percent over current total debit card transactions.

History File

Finally, the EBT demonstrations to date have adopted a strategy of providing on-line access to up to 60 calendar days of transaction activity. This information is stored in a system History File. Using an average monthly transaction level of 100 million (including administrative transactions, as described below), the History File in a Unitary Design system with a single processor would contain about 200 million records.

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[1] Bank Network News, "1990 EFT Network Data Book," Vol. 8, No. 13, November 1989.

TRANSACTION PROCESSING

An EBT system needs to process many types of transactions during daily operations. These include financial transactions and administrative transactions. For a nationwide EBT system serving 7.05 million food stamp clients and 3.77 million AFDC clients, the average monthly volume of transactions could reach 100 million. Exhibit 2-4 summarizes the nature and volume of these transactions.

Financial Transactions

Financial transactions include all transactions which affect the level of funds remaining in a recipient's or a retailer's account. As such, they include food stamp and AFDC benefit authorizations, food stamp purchases, food stamp refunds, cash withdrawals, and transfers of funds to retailers' or banks' accounts.

The only evidence to date about usage of an EBT system by food stamp recipients comes from the Reading EBT demonstration. As shown in Exhibit 2-4, Reading recipients averaged about 8 purchases and 0.01 refunds per month. On average, recipients received 1.05 benefit authorizations per month. (Recipients receive more than one authorization per month when supplemental benefits are authorized.)

Based on information from the AFDC pilot demonstration in Ramsey County, AFDC recipients make an average of about 4 cash withdrawals each month from ATMs and POS terminals. Exhibit 2-4 assumes that AFDC recipients receive an average of about 1.5 benefit authorizations each month, because some States make two authorizations per month.

In a nationwide EBT system, funds would have to be transferred to transaction acquirers each day. Because the number of transaction acquirers would be relatively small (probably less than 500, or 10 per State), the number of funds transfers is too small to warrant a separate entry in the exhibit.

Adding all the financial transactions in the exhibit yields an average monthly volume of 84.61 million transactions.

Exhibit 2-4

SUMMARY OF MONTHLY EBT TRANSACTIONS[a]

Transaction Type	Monthly Frequency per Participant	Number of Participants	Total Monthly Volume (millions)
Financial Transactions			
Food stamp purchases	8.00	7.05 million	56.40
Food stamp refunds	.01	7.05 million	.07
Food stamp issuances	1.05	7.05 million	7.40
AFDC withdrawals	4.00	3.77 million	15.08
AFDC authorizations	1.50	3.77 million	5.66
Subtotal			84.61
Administrative Transactions			
Set up new accounts	.05	7.80 million	.39
Set up new/replacement cards	.085	7.80 million	.66
FS balance inquiries	1.00	7.05 million	7.05
AFDC balance inquiries	1.00	3.77 million	3.77
Retailer deposit inquiries	15.00	222,000	3.33
Other	278.00	3,600	1.00
Subtotal			16.20
Total Transactions			100.81

Note: [a]Based on 7.05 million food stamp recipients, 3.77 million AFDC recipients, 222,000 retailers, and 3,600 local offices. Estimates of the volume of financial transactions are based on information from the Reading and Ramsey County EBT demonstrations.

Administrative Transactions

Administrative transactions include setting up new recipient or retailer accounts, initializing new access cards, placing holds on accounts when cards are reported as lost or stolen, performing balance inquiries, and other general maintenance functions.

The Reading and Ramsey County demonstrations do not provide evidence on the average number of administrative transactions performed each month for the respective food stamp and AFDC caseloads. The figures in Exhibit 2-4, therefore, represent a "best guess" as to the likely magnitude of administrative transactions. With a 5 percent intake rate for the AFDC and Food Stamp Programs, 390,000 transactions would be required each month to set up new accounts.[1] New cards would have to be issued to both new recipients and existing recipients who report their cards as lost, stolen or damaged. With a 5 percent intake rate and a 3.5 percent card replacement rate (based on data from Reading), 663,000 transactions would be required to pass card information to the database. If each food stamp recipient made one balance inquiry against the database each month, an additional 7.05 million administrative transactions would need to be processed. Similarly, if each AFDC recipient made one balance inquiry per month, 3.77 million administrative transactions would be generated.

If one-half of all retailers made daily inquiries to the database to check recent deposit information, 3.33 million inquiries would be processed each month (i.e., an average of 30 daily inquiries from each of 111,000 retailers).

Finally, to cover "other" administrative functions (e.g., checking transaction histories, entering information from manually authorized sales, placing holds on accounts, removing dormant accounts from the database), we have added 1 million transactions per month. This volume works out to about 278 transactions per month for each of the 3,600 local welfare offices, or about .13 transactions per client per month.

[1]With 80 percent of AFDC cases also receiving food stamps, the total number of AFDC and food stamp cases is about 7.80 million.

Adding all the administrative transactions in Exhibit 2-4 yields 16.20 million transactions per month. When the financial transactions are included, the total number of monthly transactions in a nationwide EBT system is estimated at 100.81 million. If a nationwide EBT system served only a portion of the national caseload, of course, the number of monthly transactions would drop proportionally.

Chapter Three

ORGANIZATIONAL FEASIBILITY

A number of organizational issues arise in the implementation and operation of a nationwide EBT system. These issues can be collapsed into four major categories:

1) cooperation among Federal Agencies in administering a multiprogram EBT system;

2) the nature of the relationship between FNS and State Agencies in administering the Food Stamp Program, including issues of cost allocations;

3) changes in the administrative responsibilities and organizational structure of FNS; and

4) changes in the administrative responsibilities and organizational structure of State Agencies.

These issues are discussed below, together with an examination of how the organizational issues vary by the development path chosen for a nationwide EBT system.

3.1 COOPERATION AMONG FEDERAL AGENCIES

An EBT system has the potential to serve as an issuance or redemption system for many different government programs. Any program which issues benefits to households or transfers funds to service providers could be included in an EBT system. Examples include the Food Stamp Program; direct cash assistance programs like AFDC, Refugee Assistance, General Assistance, and Supplemental Security Income; and programs like subsidized day care or subsidized school meals. An EBT system also could serve programs which require verification of eligibility before services are provided (e.g., Medicaid). Many of the above programs already are being included in EBT or EBT-like demonstrations.

If an EBT system is to serve multiple Federal and State programs, the administering Agencies must work together during system design, development, implementation and operations. To facilitate the coordination of effort, an interagency task force or some other intergovernmental entity would be helpful. Indeed, Federal Agencies have already developed a number of task forces to address EBT issues.

With respect to EBT system planning, development and operation, an interagency task force probably could not represent a final decision-making body. Individual Agencies would likely be unwilling to delegate such authority or unable to under existing legislation. Nevertheless, the task force could serve as a forum to address EBT system issues affecting multiple programs. The following sections identify several of these issues.

BASIC SYSTEM DESIGN

A multiprogram EBT system could be based on on-line or off-line technologies. A consensus on which technology is most appropriate may or may not exist among individual Agencies, even after all currently planned demonstrations are evaluated. Before a multiprogram system is implemented, however, the participating Agencies must agree on basic system design. Achieving this consensus would be an important goal of an interagency task force.

Another basic design issue is whether or not the system should support the interchange of EBT transactions across State borders. As explained in Chapter 2, this choice will require standardization in design components and development approach. The issue is also related to the possible integration of an EBT system with commerical POS and ATM networks. If either interchange or integration is desired, the EBT system design will have to be compatible with standards adopted by commercial networks.

DEVELOPMENT APPROACH

Once a basic design for a multiprogram EBT system is agreed upon, the next question is what approach to use to establish the system. This issue also raises the question of the relative roles of State and Federal Agencies in system design, development, implementation and operation. Should Federal Agencies take the lead in establishing an infrastructure for a nationwide EBT system (as in the Unitary Design approach to development) or should this be left to State Agencies (as in the Multiple and Standardized Design approaches)?

Regardless of the selected development approach, Federal Agencies probably will want to provide oversight for the process of designing, developing and implementing an EBT system. Oversight tasks include reviewing

system design and test plans, addressing policy issues, monitoring system acceptance tests, and reviewing implementation and training plans. Although each Agency participating in an EBT system will have its own responsibilities for oversight, the overall process can be coordinated through an interagency task force.

LEGISLATIVE AUTHORIZATION

As explained in Chapter 6, the Food Stamp Act of 1977 must be amended before the Food Stamp Program can participate in a nationwide EBT system. Legislation affecting other programs may need changes as well. A task force could serve as a vehicle to coordinate efforts to identify needed legislative changes and to provide supporting testimony to Congress. The individual Agencies would then take responsibility for promulgating any regulatory changes needed for each program. Some coordination in promulgating new regulations would be required to ensure that regulations for different programs were consistent with respect to use of an EBT system.

SYSTEM OPERATIONS

The need for coordination among Federal Agencies will not end once a nationwide EBT system is implemented. Federal Agencies will need to coordinate their oversight of ongoing system operations. Although individual Agencies probably will need to establish administrative units with responsibility for direct monitoring of system operations, there is likely to be some need for coordinating Agency responses to policy questions or problems that cross program lines.

Coordination of Agency responses may be needed at two levels. For example, Federal Agencies should realize that the EBT system itself will be a continually evolving system. States, system vendors, and Federal Agencies may seek enhancements to the system over time, either in terms of programs served, functions included, or technologies employed. Some of these enhancements may arise as commercial POS systems mature and develop new products for the private sector. Other changes may be needed as operating procedures and policies for programs served by the system evolve. Thus, Federal Agencies will continually be addressing how best to improve the system, and coordination of these deliberations will be needed.

At a second level, some coordination may be needed for day-to-day operations of EBT systems. Examples include monitoring the system's settlement of food stamp and AFDC purchases and cash withdrawals, and the interagency oversight of cost accounts and cost allocations.

Because different Agency personnel would need to be involved in the two levels of Agency interaction, these responsibilities may need to be divided across separate interagency groups. Major policy issues or questions of system enhancements could be addressed by the task force, while day-to-day issues could be handled by communication among existing administrative units.

3.2 THE ADMINISTRATIVE RELATIONSHIP OF FNS AND STATE AGENCIES

In addition to the need for coordination among Federal Agencies, FNS should recognize that the implementation of a nationwide EBT system will change the relationship between Federal and State Agencies in program administration. Some of these changes relate to who performs specific tasks; these changes are described in later sections. Of greater interest in this section is the possible fundamental change in FNS' and States' roles in benefit issuance and redemption. Other possible changes include the allocation of costs and liabilities between FNS and the States.

FNS' ROLE IN BENEFIT ISSUANCE

For the most part, FNS allows the States to determine how Food Stamp Program benefits should be issued. Program regulations specify a number of different allowable issuance systems, but States determine which system or combination of systems to use. FNS provides coupons to the States and (through its Regional Offices) audits and monitors the issuance systems States have implemented.

With the advent of EBT systems, FNS could treat EBT as just another alternative issuance system which States, at their discretion, could adopt for their entire caseload or portions thereof. In this respect, the availability of EBT systems would not change the basic administrative relationship between FNS and the States. States would continue to choose the issuance system(s) they believed to be most appropriate.

If enough States select EBT so that a sizeable portion of the national caseload is switched to EBT systems, however, FNS might consider eliminating coupon use altogether. To do so, FNS would have to rewrite program regulations, eliminating the choice of coupon issuance systems. This would reduce the States' current flexibility in choosing an issuance system best suited to their needs, and State Agencies would probably view such a situation as a major change in their relationship with FNS.

Whether an EBT system were treated as an alternative issuance system or the only allowable issuance system, the choice of development approach also has major implications for the relationship between FNS and State Agencies. In the Multiple Design approach, FNS would give States considerable latitude in choosing an appropriate system design. Less flexibility would be allowed under the Standardized Design approach, but in both approaches States retain total responsibility for selecting a vendor and implementing the system.

In contrast, the Unitary Design approach to developing an EBT system introduces a fundamental change in FNS' role in benefit issuance. In this approach FNS (in conjunction with other participating Federal Agencies) selects the EBT system vendor and operator, and States must interact with the vendor to tie into the system. Through its contract with the system vendor, FNS becomes directly involved with actual benefit issuance (as opposed to coupon supply) for the first time, and States lose some of their ability to tailor the issuance system to meet local needs. As discussed more fully in Chapter 7, some State Agencies may resist the implementation of a Unitary EBT system, believing that such a system would inappropriately reduce their ability to respond to local conditions. Thus, selecting a Unitary system not only changes FNS' role in the major program function of benefit issuance, it may require a substantial "marketing" effort on FNS' part to dispel States' concerns.

Summarizing, two aspects of a nationwide EBT system have the potential for changing States' current ability to select an issuance system and to retain total responsibility for benefit issuance. Complete elimination of coupons would limit States' choice of issuance systems, regardless of which development path for an EBT system was selected. If a Unitary system was implemented, States would share management responsibility for benefit issuance with FNS. In either situation, FNS probably would need to gather political

support at both the State and Federal level to successfully implement a policy with such broad implications for the relationship between States and FNS in administering the Food Stamp Program. The task force mentioned above could serve as the vehicle for gaining the needed consensus and political support.

In addition to the above major issues, another issue related to the implementation of an EBT system is the degree to which FNS and other Federal Agencies provide guidance and participate in States' development of EBT systems, especially under the Multiple and Standardized Design approaches to system development. In the current round of State-initiated EBT demonstrations, FNS has taken an active role in system design and, especially, testing activities. Instead of just reviewing design and test plan documents, FNS has found that greater guidance on the content and structure of these documents has been needed. FNS may find similar needs as other States develop EBT systems. Without some clear guidelines of what the role of FNS and other Federal Agencies will be as States develop EBT systems, the Agencies may find resistance and conflict concerning the appropriate boundary for Federal involvement.

STATES' ROLE IN BENEFIT REDEMPTION

State Agencies currently have no role in benefit redemption in the Food Stamp Program. As coupons are passed through retailers and financial institutions and on to the Federal Reserve, FNS monitors retailers' redemption levels and the food stamp coupon-related operations of the Federal Reserve.

With the implementation of an EBT system, States assume for the first time a pivotal role in benefit redemption. Unless the Unitary Design approach is followed, States will be responsible for seeing that POS terminals are deployed in program-authorized stores and subsequently maintained. The vendors selected for deploying terminals will be responsible for training retailers, acquiring EBT transactions and crediting retailers' depository accounts. The States' vendors also will be responsible for passing retailer redemption data to FNS and for staffing a hotline to answer retailer questions. In addition, the States will be responsible for ensuring that retailers removed from the program can no longer accept food stamp EBT transactions.

The States' new role in benefit redemption clearly changes their relationship with FNS in program administration. As discussed below, this change may affect the current relationship in cost allocation and liability for program losses.

ALLOCATION OF COSTS

FNS currently pays about 50 percent of each State's costs of administering the Food Stamp Program.[1] Seventy-five percent funding is available for the development of data processing systems which meet specific functional criteria. EBT system development costs, however, do not qualify for enhanced funding.

As detailed in Chapter 8, the development and implementation of a nationwide EBT system will be very costly. These costs can be reduced through use of existing POS terminals and processing capabilities, and the remaining costs would be shared among Federal and State Agencies. Nevertheless, some State Agencies have said that lack of enhanced Federal funding would be an obstacle to EBT system development. It is therefore possible that the focus of future debate over EBT systems will be on who pays for system development and implementation. That is, under current funding formulae, States may not have sufficient resources to initiate the development of EBT systems. If FNS decides that the benefits of EBT systems outweigh their costs, it will have to address these funding issues.

The question of FNS' share of development and implementation costs becomes an even greater issue if FNS ultimately pushes for a nationwide system that totally eliminates the use of food stamp coupons. In this situation, State Agencies would no longer have the freedom to decide between sharing the costs of the EBT system or continuing with their coupon issuance systems.

Issues of cost allocation also arise in ongoing operations of an EBT system. In all three development approaches, FNS' costs for coupon production and supply will be reduced or eliminated. In the Multiple and Standardized Design approaches, State Agencies will incur costs related to benefit

[1]The 50-percent reimbursement rate may be adjusted because of payment error rates.

redemption--costs now borne by FNS in the coupon system. In the Unitary Design approach, FNS takes on additional benefit issuance responsibilities, but it is not clear that State issuance costs would be reduced. States' issuance costs in the Unitary Design approach will depend on whether they are responsible for any of the operating charges imposed by the system vendor. The point is that whatever development approach is selected, the allocation of administrative responsibilities between FNS and the States will shift.

ALLOCATION OF LIABILITIES

Losses of program funds are possible under any benefit issuance and redemption system. As the coupon issuance systems have evolved, policies regarding the allocation of liability for benefit losses have been formulated and implemented. These policies generally assign liability to whomever has control over the benefits. Thus, States or their issuance agents assume full liability for some ATP-related issuance losses. Coupon manufacturers (under contract to FNS) assume liability for theft or loss of coupons prior to delivery to issuance points. FNS assumes liability (up to a threshold level) for mail issuance losses. States assume liability for any mail losses above the threshold level.

EBT systems will change the types of benefit losses that occur in the Food Stamp Program, eliminating certain categories of loss (e.g., transaction of duplicate ATPs) but potentially introducing other forms of loss (e.g., errors in transaction processing or overdrafts resulting from manually authorized transactions).[1] With the change in the nature of potential vulnerabilities to loss, new policies regarding the locus of liabilities will need to be formulated. As discussed further in Chapter 6, liabilities may be assigned either entirely to the States or to FNS, or they can be shared. State Agencies, in turn, may assign some liabilities to the vendors who develop and operate the EBT systems. Certainly, liabilities for losses associated with the States' new role in benefit redemption would fall in this category.

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[1]A discussion of the coupon and EBT systems' vulnerabilities to benefit loss is presented in Kirlin et al., The Impacts of the State-Operated Electronic Benefit Issuance System in Reading, Pennsylvania, Cambridge, Massachusetts: Abt Associates Inc., February 1990.

The point to be made here is that to the extent that EBT systems lead to a change in the assignment of liabilities between FNS and the States, the administrative relationship between FNS and the States changes. Plus, FNS and the States will need to develop a new process for identifying losses and charging these losses to the responsible parties.

Finally, it is important to realize that the issues of cost allocations and liability for losses are interrelated. Any changes in States' overall administrative costs due to an EBT system may be offset or exacerbated by changes in liability. Thus, both administrative costs and potential losses should be examined when considering appropriate allocation and liability rules.

3.3 ADMINISTRATIVE CHANGES AT FNS

FNS' administrative responsibilities for the Food Stamp Program are currently split among its national headquarters, seven Regional Offices, and a number of local field offices within each region.

National headquarters staff have a broad range of administrative responsibilities. Program staff determine policy, interpret and promulgate program regulations, and prepare annual budgets. With respect to benefit issuance, the national office manages the contracts for coupon printing and supply. National staff monitor the Federal Reserve's role in coupon redemption. They also oversee the investigation of possible retailer violations of program regulations.

Regional Offices serve as the interface between State Agencies and FNS' national headquarters. Regional Office staff review State Plans of Operations, act as conduits between FNS and the States for coupon orders and issuance reports, audit States' issuance systems, oversee field office activities in retailer authorization, and perform administrative activities related to compliance enforcement.

Field office staff, supervised by the Regional Offices, are responsible for authorizing retailer participation in the program and for providing retailers with information about program regulations. Field office staff participate in compliance enforcement, including the monitoring of retailer redemptions, responding to allegations of retailer fraud, and enforcing retailer sanctions.

The implementation of a nationwide EBT system will likely have two impacts on administrative responsibilities. First, because an EBT system changes how benefit issuance and redemption are performed, the specific administrative tasks to be done will change. Second, the allocation of which tasks are performed at each administrative level may change. Both sets of changes will vary depending on which development approach for an EBT system is selected.

Under the Multiple and Standardized Design approaches to system development, FNS will need to monitor the operations of State EBT systems. This monitoring will include review of system performance, system adherance to functional and special program requirements, and system costs. These review tasks could be assigned to the Regional Offices, with technical support (if needed) provided by national headquarters. Because State Agencies assume benefit redemption responsibilities under these two approaches, Regional Offices would become more involved in monitoring this aspect of program operations.

If a Unitary EBT system is implemented, FNS' management responsibilities would include the following tasks:

1) oversight of technical operations, including system performance;

2) oversight of States' interactions with the vendors, including the resolution of disputes between State Agencies and vendors;

3) monitoring of system activity levels and their relationship to vendor billings; and

4) promulgation and interpretation of program regulations and policy determination as they relate to EBT system operation.

The first three administrative tasks could be assigned to Regional Office or headquarters staff, or divided among administrative units. Headquarters staff would be responsible for the fourth task.

In any EBT system implementation, field office responsibilities could be expanded to include communication of retailer authorizations and disqualifications to the system vendor. The system vendor would use this information to schedule equipment installation or removal, and to update

system files which control retailer access to the EBT system. These responsibilities could be assigned to the Regional Offices instead, with field office follow-up to ensure that appropriate actions had been taken.

FNS' oversight of technical operations in a Unitary EBT system deserves additional comment. One major difference between an EBT system and the use of coupons for benefit issuance and redemption is the on-line, real-time nature of EBT operations. Many problems with system operations will have an immediate effect on recipients and retailers. As a result, response to the problem also must be immediate. While the system vendor will be responsible for resolving the problem, the Federal Agencies participating in the system may need to get involved as well. Thus, FNS' organizational structure for a Unitary EBT system will have to support very rapid response to major system problems, including the ability to call upon appropriate staff for assistance at all hours of the day.

3.4 ADMINISTRATIVE CHANGES WITHIN STATE AGENCIES

It is at the State and local office levels that the implementation of a nationwide EBT system will have the greatest impact on administrative responsibilities and organization. State Agencies (or County Agencies, with State concurrence) will need to decide whether or not to implement an EBT system and, if so, they will need to manage system design, development and implementation activities. Local welfare offices may be heavily involved in recipient training and EBT card issuance at the time of system implementation. Finally, system operations will change administrative activities within both the State Agency and local welfare offices.

PLANNING FOR SYSTEM DESIGN AND DEVELOPMENT

Once a State Agency decides to implement an EBT system, Agency staff need to plan for system design and development. These tasks represent major efforts in the Multiple and Standardized Design approaches. Even in the Unitary Design approach, however, some design and development work will be needed to provide the data processing interface with FNS' EBT vendor.

Within a State Agency, an "EBT work group" could provide the nucleus for organizing the State's role in system design and development. In a planned multiprogram EBT system, it would be very important to develop from the

beginning an organizational structure that ensures effective communication among all program representatives. Although the Food Stamp and AFDC administrative units already may be integrated to some extent, this may be less likely for programs like Child Enforcement or Medicaid. In those States in which a separate data processing department serves all State Agencies, representatives of that department would need to be included in the work group.

In the Multiple and Standardized Design approaches to system development, the State will probably want to procure the services of a vendor to design and develop the system. The EBT work group would prepare the Request for Proposals, choose the vendor, and work with the vendor in selecting an appropriate design and in resolving design and policy issues. Once the system design had been finalized, the work group would monitor the vendor's progress on system development, providing further input if development tasks raised new design or policy issues. The Agency's or State's data processing department would need to be heavily involved in this process, because the department will need to develop an interface system to transmit issuance data and other administrative information to the EBT system.

A major Agency task in the Multiple and Standardized Design approaches is overseeing the recruitment of program-authorized retailers and terminal deployment (the latter being an implementation task, but a task whose planning must begin during the design and development phases). The Agency could assign retailer recruitment to the system vendor or negotiate separate contracts with financial institutions or third parties interested in deploying terminals throughout portions of the State. As discussed in Chapter 2, terminal deployers also will be responsible for acquiring transactions and crediting retailers' accounts at the end of each day's processing. Thus, any contracts negotiated by the State Agency would need to cover activities after system start-up as well as initial terminal deployment. In a Unitary EBT system, these tasks will be the responsibility of FNS and its vendors.

PLANNING FOR SYSTEM IMPLEMENTATION

A great deal of effort is needed to implement an EBT system, even after the system's hardware and software have been thoroughly tested and approved by State and Federal Agencies. These activities are primarily

related to terminal deployment and retailer, recipient and office staff training.

The vendor(s) responsible for terminal deployment will need to enter into contracts with individual retailers and plan for terminal installation. During installation, store managers and staff will need instruction on how to use the system. If the system vendor is not responsible for terminal deployment, the terminal deployers will have to work closely with the system vendor during retailer recruitment so they can inform the retailers about planned system design and functionality. The State Agency will have to ensure that the various vendors pass the required information among themselves and arbitrate any disputes that arise.

The State Agency also needs to make final preparations for staffing of recipient and retailer hotlines. Hotline personnel need to be trained on their responsibilities, and the communications lines need to be installed.

Finally, the State Agency needs to pass information about the first group of EBT recipients to the system vendor so accounts can be established on the system's files. Depending on card issuance procedures, similar information may need to be sent to the card manufacturer. Just prior to system start-up, the Agency needs to send an issuance authorization file to the vendor so that program benefits can be credited to recipient accounts.

One major organizational issue to be resolved during the contract negotiations with the system vendor is who will be responsible for training recipients and issuing EBT cards when the system is first implemented. Although Chapter 2 concluded that card issuance and training after system implementation are likely to be handled by local offices, local offices may not have the resources to train large groups of recipients in a short period.

If local offices are to be responsible for card issuance and recipient training during implementation, the State will have to coordinate these activities, perhaps with assistance from the vendor. Depending on system design, card encoding equipment may have to be purchased and installed. Card stock will have to be designed and purchased, and local office staff may have to be trained in card encoding procedures. Training materials will have to be developed, and local office staff will have to be trained on how to instruct recipients to use the system. Finally, local office managers will

need to address the logistics of card issuance and training: how many training sessions will be held, when, and which recipients will be trained at each session?

Final preparations at the local level for system implementation include installation of system workstations and the training of office staff in how to use the workstations to pass information to or access information from system files. Procedures for local office staffing of the recipient hotline also need to be finalized. Communications lines supporting the workstations and the hotline may need to be installed and tested.

EBT SYSTEM OPERATIONS

An EBT system changes the operating responsibilities of both State and local offices in the administration of the Food Stamp Program.

Changes in State Agency Responsibilities

In those portions of a State which are converted to EBT, the State Agency will no longer be responsible for coupon issuance activities. The State will no longer have to negotiate contracts with coupon issuance agents, nor will it have to order coupons or monitor changes in coupon inventory (and bill the agents for losses). In areas where ATPs were being issued, these ATPs will no longer have to be printed, issued and reconciled. Where coupons are mailed to recipients, this task is eliminated.

The elimination of coupon and ATP issuance responsibilities may eliminate the need for certain administrative units at the State and local level. In offices where coupons or ATPs are issued over the counter, the elimination of these tasks will allow this space to be converted to other purposes (although other space will be needed for ongoing card issuance and training activities).

The State Agency, however, will assume responsibility for many new tasks under an EBT system. In the Multiple and Standardized Design approaches, the State will have to supervise the vendor's operation of the EBT system. This supervision will include:

- ensuring that performance standards are being met;
- reviewing vendor billings and comparing them to system activity levels (if activity levels form the basis for billings);
- reconciling authorized and posted issuances;
- compiling information about EBT issuances and redemptions and submitting these data to FNS; and
- compiling and monitoring other management data.

Many of these tasks will also be present in a Unitary system. In a Unitary system, however, the State will not be responsible for managing the system operator's contract.

The previous section noted FNS' need to be able to respond quickly to major system problems if a Unitary EBT system is implemented. If the State's vendor is operating the system, this need for rapid response passes to the State Agency. Again, while the system vendor is responsible for correcting any problems, State staff may need to monitor the problem and push for immediate response.

The largest EBT-related change in administrative tasks at the State level will be the State's new involvement in benefit redemption. In the Multiple and Standardized Design approaches the State, through its selected vendors, will be responsible for ensuring that the following activities are performed:

- terminals and associated equipment are deployed in new stores;
- retailers receive training in how to use the equipment;
- equipment is removed from stores leaving the program;
- EBT equipment is properly maintained; and
- retailers receive credit for EBT transactions.

Other changes in ongoing operations include: passing information on new accounts and issuance authorizations to the system operator; maintaining a recipient hotline during hours when local offices are not open; and compiling information for FNS' reconciliation of redemptions and debits to its account at the U.S. Treasury.

Cost accounting for the EBT system also may be different than in the coupon issuance systems. In a multiprogram EBT system, current cost allocation plans (assigning State and local costs to individual programs) may need to be updated. While the same accounting unit at the State level could handle the new responsibilities, new methods for acquiring and compiling the required information may need to be devised.

Changes in Local Office Responsibilities

Local welfare offices will no longer be responsible for any coupon issuance activities in an EBT system. Instead, they become responsible for EBT card issuance and recipient training. In addition, local office staff will need to assist in staffing a recipient hotline. Finally, local office staff will need to learn how to access the system (through workstation terminals) to pass information on new, lost or stolen cards to the system. Staff will also need to know how to access the system's history file, to assist clients who have questions about account balances or who report problems with specific transactions.

These new tasks may require some reorganization of local offices' administrative structure. New units, for instance, might be established for card encoding, recipient training and hotline staffing. Because recipients' questions about issuances would be channeled to the hotline, caseworkers' involvement with issuance-related activities would be decreased.

3.5 SUMMARY

Implementation of a nationwide EBT system will entail major changes in administrative responsibilities and structure at the Federal, State and local levels. Federal Agencies will need to coordinate efforts to establish a multiprogram system. With respect to the Food Stamp Program, a nationwide EBT system will affect administrative functions and relationships both within and between FNS and State Agencies.

One organizational issue in the establishment of a multiprogram EBT system is the need for an interagency task force to coordinate efforts at the Federal level. This task force could address questions of appropriate system design and development approach, needed legislative changes, and allocation of system costs across programs. The task force would include representatives of all Federal programs which might be served by an EBT system.

Regardless of development approach and final system design, an EBT system will shift the locus of program administrative responsibilities between FNS and State Agencies. In the Multiple and Standardized Design approaches, State Agencies will be responsible for benefit redemption activities for the first time. If a Unitary EBT system is implemented, FNS will become much more involved in benefit issuance than under the coupon system. These shifts in administrative responsibilities may raise concerns over the appropriate allocation of administrative costs and liabilities between FNS and State Agencies.

Even if an EBT system did not change which organizations were involved in benefit issuance and redemption, specific administrative duties will change. Issuance authorization files must be passed to the system vendor, operations must be monitored, and system accounts must be settled and reconciled each day. Thus, both FNS and State Agencies may find a need to reorganize their administrative structures, assigning new duties to new or existing administrative units. Within FNS, the allocation of administrative responsibilities across national, regional and local field offices may need to be changed. The exact nature of needed changes within FNS and State Agencies will depend on which type of EBT system is implemented.

Finally, while system vendors will be responsible for operating an EBT system and responding to problems, Federal and State Agencies must recognize that--depending on who manages the vendor contract--they have ultimate responsibility for ensuring that the system does not adversely affect program participants. If major system problems develop, the responsible agency must be prepared to take immediate action to see that the problem is corrected as quickly as possible.

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Issues concerning the technical feasibility of an off-line EBT system are somewhat different than those examined in this chapter; these issues are discussed in Appendix A.

4.1 AUTHORIZATION PROCESSING

Authorization processing is the heart of an EBT system. Unlike coupon systems, where paper is exchanged for authorized food items, an EBT system uses electronic means to achieve the same result.

Several points of contact bring the recipient, the State Agency and the retailer together. The access or benefit card is the most common focus for all participants.

ACCESS CARD

Access or benefit cards provide participants with entry into the EBT system. Approved retailers, recipients, and Federal investigative staff will be the primary participants of an EBT system that will receive access cards. While not generally done, the State Agency could expand card use to include other functional areas, such as system access by local assistance office staff. For purposes of clarity, however, only generally recognized card usage will be considered here.

An EBT access card must fulfill two functions. First, the card must contain information that verifies the cardholder's authorization to use the system. Second, the card must contain information that identifies which system account is being accessed.

Access cards meeting these requirements are in widespread use in on-line debit and credit card applications throughout the country. These cards are known as "standard magnetic stripe cards" and are characterized by an encodable magnetic stripe on the back of the card. The cards conform to a series of industry standards for card materials and magnetic stripe encoding. Card materials are specified by International Standards Organization (ISO) 7810. Magnetic stripe location, size, width, length and encoding are specified under ISO 7813-1985 and ISO 7811/2-1985. ANSI (American National

Standards Institute) Standards X4.13, X4.16 and X.21 provide guidelines for the creation and embossing of cards and magnetic stripe encoding.[1]

Magnetic stripe cards meet the requirement of identifying which system account is to be accessed by encoding an account identifier on the magnetic stripe. The identifier includes codes specifying which financial institution issued the card and the customer's account number at that institution. Together, these codes represent the card's Primary Account Number (PAN), which uniquely identifies which financial account can be accessed by the card.

The requirement of verifying the cardholder's authorization to use the card is handled in different ways in different applications. For debit card applications, the card user must enter a personal identification number (PIN) when using the card. The entered PIN is encrypted and compared to the PIN selected by the authorized user at card issuance. The comparison may be done at the system's host computer or at the terminal where the transaction is taking place. In the latter case, an encrypted version of the customer's PIN (called a "PIN offset") must be encoded on the magnetic stripe.

An alternative form of verification is manual comparison of the card user's signature with the authorized user's signature on the back of the card. Nearly all credit card applications use this approach. Although PIN processing capabilities are available in some credit card networks, they generally are not used and are not gaining acceptance by the retail industry. Credit card applications tend to rely instead on reports of lost or stolen cards to deter unauthorized card use.

The technical feasibility of using standard magnetic stripe cards in an EBT system is not in question, regardless of development approach. Over 180 million cards are currently in use for debit card applications, primarily for access to ATMs. Credit cards represent approximately another 200 million cards in use. In an EBT system serving both the Food Stamp and AFDC Programs, about 7.8 million cards would be needed initially. Card manufacturers should

[1]ANSI Standard X4.13-1983, "Financial Transaction Cards," ANSI Standard X4.16-1983, "Magnetic Stripe Encoding for Financial Transaction Cards," and ANSI Standard X4.21-1981, "Specifications for Data Exchange for Interindustry Financial Transaction Cards."

be able to provide this quantity without difficulty. Ongoing card requirements for new recipients and for replacement of lost, stolen or damaged cards would be about 7.9 million cards annually.[1] Again, card supply should not be a problem.

Card security for magnetic stripe cards is high. Industry standards and the relatively high costs of equipment for card creation and encoding eliminate all but the most serious attempts at duplicate card creation.

If magnetic stripe cards are to be used in a nationwide EBT system, Federal and State Agencies should insist that the cards meet the standards adopted by the financial services industry. This decision will facilitate the integration of EBT and commercial networks, and it will reduce card manufacturing costs.

IN-STORE DEVICES

An EBT system will require deployment of in-store devices at participating program-authorized stores. These devices include card readers, PIN pads, POS terminals, receipt printers, and balance-inquiry devices. Each device has been implemented in a large number of varied environments. Thus, the technical feasibility of using each component in an EBT system is not in question. However, for completeness in understanding, appropriate technical information for each device is discussed below.

Card Readers

Two types of card readers exist for magnetic stripe cards. One version requires the customer to physically insert the access card into the reader; this type of insert reader is widely used in ATMs. The second type requires the customer or sales clerk to pass (or swipe) the card's magnetic stripe through a slot which contains the reading heads of the device. Most POS devices located at sales counters use this second type of card reader.

[1]The estimate of 7.9 million new cards each year is based on a monthly replacement rate of 3.5 percent and an intake rate for new recipients of 5.0 percent.

In an on-line debit or credit card application, the card reader's sole function is to read the information encoded on the access card's magnetic stripe and to pass this information to the POS terminal. All other processing associated with authorization is performed independently of the card and card reader.

PIN Pads

PIN pads are used to verify the recipient's identity for authorization purposes. Sometimes referred to as the "electronic signature", PIN processing is a key design feature of EBT systems.

Card readers can be physically integrated with either the PIN pad or the POS terminal. The choice of hardware configuration imposes different requirements on PIN pad functionality. If the card reader is attached to the PIN pad, then encryption of the PIN is possible within the PIN pad. The PIN pad would use the entered PIN, the card number and an encryption key (or algorithm) to calculate the encrypted PIN. The encrypted PIN would then be passed to the POS terminal for inclusion in the transaction request. If the card reader is attached to the POS terminal instead, then PIN encryption cannot be performed within the PIN pad because the card number is not known. In this situation, the cable linking the PIN pad to the terminal must be physically secure to prevent intercept of the PIN.

Two methods of PIN encryption and verification are available in on-line processing: device PIN encryption with host verification; and device PIN verification with PIN offset.[1] No PIN verification is an untenable third option because lost or stolen cards could be used to initiate transactions.

With device PIN encryption and host verification, the PIN is encrypted at either the PIN pad or terminal. The encrypted PIN is then sent to the host processor for verification. With device PIN verification with PIN offset, the offset must be encoded on the access card. The PIN pad or terminal computes a new offset based on the entered PIN; it then compares the computed and encoded offsets for verification.

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[1]This latter approach is also known as PIN verification with verification value, or PVV.

A number of standards exist for PIN pads and PIN security. The main standard is ANSI Standard for Personal Identification Number (PIN) Management and Security (X9.8-1982), which covers recommended practices for PIN verification and PIN processing between institutions. PIN pad specifications are covered under ANSI X3.118-1984, "Personal Identification Number - PIN Pad."

ANSI Standard X3.92-1981 and ANSI Standard X9.8 describe the required structure for the data encryption algorithm (known as DEA or DES) used for PIN encryption, as well as techniques for protecting and updating the algorithm. (These techniques are often referred to as "PIN key management"). Guidelines for Online Debit Card Systems at the Point of Sale, produced by the American Bankers Association (1987), contains supporting information for PIN processing at the point of sale.

Any implementation of an EBT system should conform to the industry standards for PIN pads, PIN security, and PIN key management. While adherence to these standards will increase system complexity and cost, an EBT system which fails to conform to the standards will be less secure and incompatible with commercial POS systems.

POS Terminals

In an on-line system, POS terminals are responsible for creating the transaction to be authorized and transmitting it to a centralized authorization processor. The terminal then receives the processor's authorizaion reply. In stores with a large number of terminals, the transaction messages may first pass through a concentrator, which formats the transaction messages and uses a higher capacity and faster transmission line to the central processor.

A wide variety of terminal models are available from a large number of manufacturers. The models vary in terms of processing functionality (i.e., the types of transactions that can be initiated at the terminal), memory capacity, supported transmission rates, keyboard design, and display capabilities.

The required characteristics of an EBT terminal will depend on detailed system design issues and whether non-EBT transactions may be initiated at the terminal. If an EBT system serves multiple programs or commercial

applications, the terminal's functionality requirements increase. In a system serving both food stamp and cash assistance programs, for instance, the terminal will have to differentiate between food stamp and cash assistance transactions. This will require a designated function key on the keyboard to identify which program's benefits are being accessed. If non-EBT transactions are allowed, further key designations may be needed. At a minimum, the terminal must have sufficient function key to allow clerks to select the transaction being performed (e.g., purchase, refund, void, reversal, balance inquiry).

Many terminals support multiple transmission baud rates (e.g., 300, 1200, and 2400 bits per second) for communications with the transaction acquirer. If multiple rates are not supported, the terminal's baud rate must match the acquirer's baud rate.

POS terminals also vary in terms of the flexibility of their software programming. When reprogramming is necessary, some terminals require on-site programming while others accept downline programming from a central computer. The same is true for updates to the terminal's encryption key.

In general, a POS terminal's cost will increase with greater functionality, higher baud rates, or increased flexibility in software programming.

Receipt Printers

The Federal Reserve System's Regulation E requires that customers using POS terminals be provided with a receipt showing the details of the purchase. In addition, FNS requires that receipts for food stamp EBT purchases show the recipient's remaining balance of food stamp benefits.

Customer receipts can be manually prepared or electronically printed. The guidelines document prepared by the American Bankers Association (ABA) specifies that either approach is permissible at attended terminals. At unattended terminals or at attended terminals where account selection is available, however, electronically produced receipts are required. An example of account selection is when a commercial customer can choose to have his or her purchase debited from a savings or checking account. Similarly, account selection is available if an EBT participant can choose between having cash assistance or food stamp benefits used to pay for a purchase.

The ABA guidelines list the data elements which should be included on the receipt. For illustration purposes, Primary Account Number (PAN) or card number, date, time, amount, etc. are required. Remaining balances are not one of the data elements listed, so this needs to be a special Food Stamp Program requirement for an EBT system.

While a receipt printer is required to provide Federal Reserve Regulation E information, Regulation E does not apply to EBT systems.[1] Nevertheless, an EBT system should accommodate these requirements as closely as possible to ensure compatibility with other networks or future requirements.

Balance-Inquiry Devices

Balance-inquiry activity in most systems is an important customer feature. In the early stage of ATM network implementations, balance-inquiry transactions represented a significant portion of on-line transaction volume. When ending balances began to be printed on receipts, balance-inquiry volume dropped dramatically. As a result, capacity upgrade requirements in many networks were slowed. Periodic activity statements from ATM providers, required by the Federal Reserve's Regulation E, also serve to reduce the number of balance inquiries.

As discussed in Chapter 6, Federal regulations do not require periodic activity statements in an EBT system. Moreover, such statements probably would be of limited usefulness to Food Stamp Program and cash assistance recipients, because most recipients can be expected to exhaust their monthly benefits by the end of the month.[2] Thus, an EBT system must provide recipients with methods to check their remaining balances. In addition to the balance information printed on transaction receipts, ATMs, stand-alone POS terminals and audio response units can be used to provide balance information.

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[1] Chapter 6 discusses Regulation E.

[2] The evaluation of the Reading EBT demonstration found that 87 percent of all food stamp recipients used their total monthly allotment by the end of the month. See Susan H. Bartlett and Margaret M. Hart, Food Stamp Recipients' Patterns of Benefit Redemption, Cambridge, Massachusetts: Abt Associates Inc., May 1987.

ATM Networks. An ATM network may be used to provide outlets for recipient balance inquiry. Traditionally, these balance-inquiry capabilities have been available only to network participants, who were in many cases the original network founders. Increasingly, ATM networks are making outside access available to improve usage of hardware and telecommunications capacity and to generate more transaction volume and corresponding revenues. As network participation expands beyond the boundaries of original participants, these cash-dispensing and balance-inquiry services could become available to EBT participants.

Certain benefits, such as cash assistance, are appropriate for delivery via an ATM network. The technical feasibility of this approach has been tested in the Ramsey County Electronic Benefit System (EBS) demonstration.

To use existing ATM networks in an EBT system, the system developer must negotiate with the networks and build an interface between each network and the system. Balance-inquiry and cash-withdrawal messages initiated at an ATM must be passed from the network to the EBT system, and response messages must be returned. The EBT system and the network must settle cash withdrawals at the end of the processing day. Once the interface is established, tested and certified by the ATM network, EBT participants can use network ATMs for balance inquiries, and cash assistance recipients can withdraw cash benefits.

Stand-Alone POS Devices. To minimize checkout delays associated with the balance-inquiry activities, separate, dedicated POS devices could be provided for recipient balance inquiries. Aside from not being able to authorize purchase or refund transactions, these devices would function in the same manner as POS terminals. The devices should be customer activated, with appropriate PIN and receipt printing capability. In low-volume stores, however, regular POS terminals could be used for balance inquiries, saving the costs of providing balance-inquiry-only devices.

Where POS activity is new to a store, adding balance-inquiry-only capability may be relatively easy. When POS is already established, however, adding balance-inquiry-only capabilities will be subject to existing processing procedures within individual stores. Both situations need to be considered in an EBT implementation. One might expect some retailer resistance to adding stand-alone devices because the devices further reduce store

sales space. Negotiations with retailers for stand-alone devices are likely to be successful, however, once retailers realize that they can reduce the incidence of denied EBT purchase transactions due to insufficient remaining benefits.

Audio Response Units. Audio response units (ARUs) enable customers to obtain information from or write information to electronic databases through the use of touch-tone telephones. Information is delivered to the ARU by entry of data on the telephone keypad. The ARU delivers information to the customer using synthesized voice computer technology.

Audio response units have matured into cost-effective devices for delivery of account balance and status information. Recent ARU advances in the use of personal computer (PC) technology have significantly lowered development, implementation, and on-going operational costs. The result has been rapid expansion and use of ARUs for functions that were previously uneconomical.

The latest generation of ARUs has assumed the mundane task of supplying customers with basic account status. Staff interaction with customers is reserved for processing complex, high-value transactions. Frequently, customers use ARUs to obtain a consistent level of quality interaction with an institution and to control the timing of the interactions. After installation of a ARU, telephone inquiry volume increases of 30 percent or more are testimony to the popularity of ARUs. Often, these volume increases result directly from word-of-mouth references, further attesting to the popularity of ARU processing.

The next generation of ARUs is beginning operation and performing basic voice or speech recognition. Simple words, such as yes, no, and numbers, are recognizable in a high proportion of cases. Voice recognition opens ARU usage to customers who do not possess a touch-tone phone, which is approximately 30 percent of the population.

Under certain circumstances, such as transaction disputes, providing a record of detailed transaction processing activity may be required. ARUs, properly programmed, are capable of providing transaction information or a voice transaction statement, which may aid recipient determination of disputes. Actual resolution of a dispute, however, requires human intervention.

With the proper set of controls, ARUs could be used for transaction authorization. For instance, a PIN-like number, such as birthdate, case number, or social security number, along with special merchant information, could provide sufficient information to allow transaction processing through the ARU. Further research and thought is required to ensure that appropriate ARU access is controlled, because access is available to anyone having the phone number and security codes. Because ARU information crosses public access networks and is subject to interception, ARU processing risks must be adequately assessed prior to allowing transaction processing. However, the appeal of the ARU is that, with reasonable controls, financial transactions can be processed without a POS terminal present. The cost savings from this approach could be substantial. That is, terminal deployment and servicing costs could be reduced or limited to those retailers capable of supporting specific transaction volumes. Retailers not meeting minimum processing volumes would be asked to use ARU processing.

Feasibility of Development Approaches

All of these in-store devices or components are available "off-the-shelf." Differentiation and expansion of features provided by every manufacturer are increasing at an astounding pace. Moreover, the ability to integrate any or all of them into an EBT system is more than possible, as most of these components have been integrated into similar systems on numerous occasions. Novelty and complexity of function are the key evaluation aspects. Newer functions, not time-tested in the marketplace, are more likely to cause service disruptions. While consumer interest in new approaches is likely to generate curiosity, service disruption is the fastest way to turn curiosity to dissatisfaction. Trust and convenience are the consumer keys to continual use and expansion of benefit processing systems.

With respect to implementation of a nationwide EBT system, a nationwide EBT system could require the deployment of about 577,200 terminals, PIN pads and printers--an 11-fold increase over a currently installed base of about 51,000 debit card terminals. Because it would take at least several years to implement a complete nationwide system, however, manufacturers should have sufficient time to respond to the increased demand. Nevertheless, shortages in terminal supply could delay implementation in some areas.

The technological feasibility of providing balance-inquiry devices is not affected by the choice of development approach. ATMs, stand-alone POS devices, and ARUs can be used, alone or in combination, with each of the three development approaches.

Regardless of implementation approach, connecting to appropriate ATM networks should be encouraged. In the case of national ATM networks, membership at the Federal level might facilitate entry by State Agencies wishing to implement EBT systems. Regional network participation should be supported and encouraged at the Federal level in equal partnership with the State Agencies. In many cases State Agencies, closer to local issues, will deal more effectively with regional networks, and they should be encouraged to do so. However, participation of all benefit agencies in all networks should be a broad policy goal. Broad policy support by Federal Agencies for this approach may be the only participation required for implementation of this direction.

TELECOMMUNICATIONS NETWORK

An on-line POS network relies heavily on telecommunications. Even in the most simple POS network, transaction messages must be passed between terminal and authorizer over a communications network. As the complexity of the network structure increases, so does the required telecommunications support. When different organizations act as acquirers, switches and authorizers, for instance, every link between organizations requires telecommunications support. Fortunately, much of the telecommunications infrastructure needed for an EBT system already exists. The primary exception is the required linkage between retailers and transaction acquirers. In some areas, however, even this infrastructure is present for existing credit card and debit card operations.

The telecommunications infrastructure within the United States provides many options for service delivery. The costs for each option varies and is a key consideration in any implementation. In addition to transport facilities (such as WATTS, value added networks, and private networks), a variety of options may be implemented to improve response time or transaction integrity.

In any discussion of networks, communications protocols require a brief review. A communications protocol is the set of rules used between two

points to send and receive information. Protocols come in many varieties of increasing sophistication and complexity and include asynchronous, synchronous, and multi-layered protocols. Several organizations, such as Comite Consultaif Internationale de Telegraphique et Telephonique (CCITT) and International Standards Organization (ISO), have developed industry standards for communications protocols.

A number of different communications protocols are available for network facilities. Simple protocols, such as dial asynchronous (async), require the terminal to initiate the transaction and provide inexpensive means to achieve terminal connectivity. Synchronous protocols are often used with leased communications lines and require the acquirer to "poll" each line it serves to see if a transaction is waiting to be processed. Multi-layered protocols are more complex and follow standards outlined under the Open System Interconnection (OSI) model. Seven layers (Physical, Data Link, Network, Transport, Session, Presentation, and Application) are represented in a layered protocol. Each layer establishes communication with similar components within the network. Such a communication scheme allows a complex network to connect many different components in a standard manner. Layered protocols provide much flexibility for network processing. However, the costs to establish and maintain these protocols are usually not trivial. Any group wishing to use a layered protocol must have sufficient resources to provide appropriate support.

Dial Facilities

Dial facilities refer to an approach in which a merchant dials, either manually or via the POS terminal, a phone number connecting to the acquirer to obtain a transaction authorization. Typically, the telecommunications session between the terminal and acquirer progresses in the following manner:

- the terminal dials the acquirer's number;
- the acquirer responds with an enqueue (ENQ) message, indicating that it is ready to receive transaction data;
- the terminal sends a transaction to the acquirer;
- the acquirer processes the transaction or routes the transaction to the authorizer;

- the acquirer sends a response message to the terminal;
- the terminal acknowledges (ACKs) receipt of the response and displays response information; and
- the acquirer sends an end-of-transmission (EOT) message and drops the session.

In most cases the easiest implementation of POS-like activities is through dial-up telephone lines.

Networks using dial access require public telephone lines to receive in-bound calls. The type of dial service and distance between end points have a direct bearing on the costs for using this service. Merchants using the dial capability may have "business service" phone service, where each call receives a service charge. Costs could be even higher where long distance rates are in effect.

Several dial capabilities exist which, if used, eliminate merchant dial costs. The most widely used approach is Wide Area Telephone Transmission Service or WATTS, which provides toll free calls to merchants using a local or national "800" number. A second approach uses one number (976-xxxx) to dial into a local node, and the transaction is routed to the designated destination. Third, a private network with local dial support can be used to deliver transactions for authorization. Fourth, access can be made through a local node of a value added network or packet switch network. Other dial options are available, and more will become available in the future. All options are technically feasible for any of the development approaches under consideration. However, costs are the primary prohibitor to usage of a given dial access capability.

Dial access, however, does have some negative features. The time required to dial the acquirer's number and relatively low transmission speeds (300 baud or, more normally, 1200 baud) increase response times. Also, data transmissions may be corrupted due to poor line quality. If a sophisticated communications protocol is not used, these corrupted transmissions could result in errors in data processing (as when reversals are not properly identified and processed). Finally, if the terminal operator breaks the communications connection or if the terminal "times out" waiting for a delayed response message, transaction processing cannot be completed and the transaction must be reversed.

Leased-Line Facilities

Leased lines are communications facilities which provide dedicated service between two points in a communications network. They support higher-speed data transmission (e.g., 9600 baud) and better line quality than dial-

lines. With leased lines there is also no need for the terminal to spend time dialing and connecting to the acquirer; the line connection is always there, ready for immediate transmission of data. While there are many implementation options available, leased lines are used to either drive terminals directly or connect between two central host complexes.

Typically, leased-line facilities are used to support merchants operating their own network or those requiring higher throughput due to high sales volumes within the stores. Grocery stores use these line facilities to a lesser extent than other industries, but that trend is changing. Examples of these facilities abound in the department store industry. Montgomery Ward, JC Penney's, Macy's, Sears, and others use leased-lines and multi-layered protocol networks (such as in-store processing, network transmission, and central location authorization) for credit card authorizations. Volumes are discussed in tens to hundreds of transactions per second. Response time objectives frequently require authorization and transaction turnaround to be 10 seconds or less.

Equipment sophistication and the processing infrastructure required to support a leased-line environment is expensive and complex. For example, supporting a multi-lane grocery store using a leased-line facility requires hardware, a communication's controller, and software (system and application) for operation of the external line and the internal lines to the checkout lanes. In some cases, stores already have in-store equipment (such as scanners and inventory control) which may require much of this infrastructure. But, adding the terminal hardware at the checkout lanes and controller

Other Communication Facilities

It is technically feasible to transmit POS transactions over facilities other than dial or leased communications lines. Examples include radio and satellite transmissions. Indeed, some public and private communications networks already use satellite transmissions between some network nodes.

An interesting question is whether radio or satellite facilities can be used to pass messages between POS terminals and acquirers. Some efforts to use radio facilities have been made, but a serious problem is the lack of available frequencies. Nevertheless, in rural areas which are not served by adequate telephone service, these other facilities might provide the communications support needed to transmit POS transactions.

Feasibility of Development Approaches

In each of the three development approaches, dial access should be seriously considered as the most cost-effective and technically feasible means of delivering on-line transaction processing.

While the leased-line environment is technically feasible, implementations using this approach should be limited. Examples where leased-lines are likely to be cost-effective are the connection of authorization systems, such as in a regional EBT network. Similarly, transaction complexity and the need for communication security (i.e., when State or local office staff interact with authorization databases) could be criteria for using leased-line facilities. Because installation costs are high, leased lines should not be considered for participating retailers unless the infrastructure is already in-place and operational.

CENTRAL SITE PROCESSING

Central site processing in an on-line EBT system involves transaction authorization, maintenance and update of the system's client authorization file (including posting of benefit authorizations), system settlement, and generation of management reports. To support these functions, the system must have hardware processing capability as well as terminals which are used for accessing data. Workstations, switching equipment, peripherals,

and telecommunications are all required to provide a "platform" for the maintenance and update of the databases. Transaction processing capability requires sufficient switching capacity and disc drive capacity. Telecommunications capacity is required for transaction delivery from terminals located in the field.

Switch Requirements

Usually, switches are responsible for routing information between points. Switches operate in two realms: transaction routing and telecommunications management. For both functions, the hardware must be capable of supporting the systems and application software required to interact with the telecommunications network and must route transactions between points in the network. In addition, with availability a critical service requirement of these systems, the hardware must be capable of fault-tolerant processing. That is, the hardware should be able to continue data processing even if individual components within the processor or internal links to the databases fail.

System developers can use minicomputer or mainframe components to build a hardware platform capable of meeting the switching and processing needs of these systems. The price and performance of these platforms are comparable. Required capacity is dependent upon the environment and projected transaction volumes. Processing functionality available with a given hardware configuration depends upon available software for that configuration. In many cases there are trade-offs between functionality and performance (an issue discussed further in Section 4.2).

Peripherals

Peripherals include disc drives, sometimes known as Direct Access Storage Devices or DASD (pronounced "Dazz Dee"), tape drives, and terminals. Disc drives provide non-volatile (i.e., they retain stored information without power), high speed data retrieval storage. They are used to access frequently used information (such as merchant information) or to support current processing activity (such as transaction requests). Disc drive requirements are based on projected transaction volumes and the amount of information required. With a larger system, more DASD will be required to support processing.

Tape drives are used for backup of disc drive contents and for unloading transaction logs. Tape drives are capable of storing large amounts of data with very slow speed data retrieval. In most cases, no more than two to three tape drives will be required in a system. One of these tape drives will be required as a backup in the event of tape drive failure. Triple density or high density tape drives capable of storing up to 6,250 bits per inch (BPI) are usually the best for backup purposes. High density tape drives are capable of rapid storage of data as well as storing significant amounts of data.

Other peripherals (e.g., workstation consoles) are required to support operational interaction with the system, such as issuing commands instructing the computer to start or stop processes. Workstations also are required at State and local offices to provide access to the system for administrative functions (e.g., setting up new accounts, placing "holds" on accounts when cards are reported lost or stolen, and reviewing transaction histories for individual accounts).

Telecommunications

Telecommunications requirements include lines and connections to the computer system for delivery of transaction processing information from the communications network. The number of lines is dependent upon the network implemented. Dial networks usually require the highest number of lines for the terminal base. Leased lines will usually require the least number of lines for the network installation.

Feasibility of Development Approaches

The hardware, peripherals and telecommunications components required to support central site processing of EBT transactions are all currently available within the marketplace. Because these components are in use in existing POS debit card networks, there is little reason to believe that their application to EBT systems would not be technically feasible.

As discussed in Chapter 2, however, a Unitary EBT system serving both the Food Stamp and AFDC Programs would have to handle about 100 million transactions per month, or an average of 3.3 million financial and administrative transactions per day. During periods of peak activity, the volume could

easily reach 6 million transactions per day.[1] Hourly peak volume could reach as high as 800,000 transactions,[2] or an average of over 200 transactions per second. Interviews with several representatives of the POS industry suggest that this throughput is much higher than existing networks handle, and probably at the very limit of most existing hardware platforms. Most of the respondents believed that an EBT system of this size could be developed, but that it would be cumbersome to manage and operate. The telecommunications and hardware requirements would be substantial, as would database backup and disaster recovery requirements. The prevailing view was that a regional version of the Unitary system would be more manageable and efficient.

4.2 APPLICATION SOFTWARE

Application software integrates the functions required to establish and maintain system participants (retailers, networks, agencies, and recipients), distribute funds to authorized accounts, process financial transactions, and settle the transfer of dollar activity among participants. Due to the time-critical nature of transaction processing, transaction throughput and response time must be considered in light of forecast transaction volumes.

Existing POS and ATM-type application software can be adapted to electronic benefit processing functionality. As with any situation in which new features are being added to existing software, however, some modifications will be required. Commercial POS networks, for instance, do not post benefit authorizations to a client authorization file (the card-issuing financial institutions maintain the cardholders' account information), nor do they provide manual, backup processing when system components are unavailable. Experience with the EBT demonstrations suggests that these modifications can be time consuming (designing and developing the final EBT system has often

[1] In a computer simulation of projected daily food stamp transactions in the Ramsey County EBT demonstration, the maximum daily volume was estimated to be 5.3 percent of total monthly transaction volume.

[2] In the Reading EBT demonstration, peak hourly volumes often represented approximately 15 percent of daily volumes.

taken 15 to 20 months), although repeated applications of EBT systems in other sites probably would require less time.

The application software currently available in the marketplace has well known strengths and weaknesses. Generally, software which provides a wide range of functions, such as ease of use and multiple card processing options, does not provide efficient high-end volume processing. In contrast, software which supports high performance tends to focus less attention on the diversity of functions which can be supported.

The segmentation between functionality- and performance-oriented software has been exacerbated over the years by the marketplace focus of the application software companies. Less volume sensitive institutions have focused on functionality software. Large networks and financial institutions, which require highly reliable performance, have gravitated toward performance-oriented software.

The functionality-oriented software market is much larger than the market for performance-oriented software, and costs for each are inversely proportional to market size. That is, functionality-oriented software is generally less expensive, partly because product offerings are differentiated, allowing institutions to purchase varying levels of functionality to meet specific needs. (Of course, increased functionality increases costs proportionately.) Performance-oriented software tends to cost more because performance is difficult to differentiate (i.e., it is either there or it is not).

Market domination by a few key software players is expected to continue. Consolidation and purchase of the major participants has occurred over the past several years and has provided an increased capital base for further market consolidation. With capital becoming an entry barrier, weaker market participants are expected to leave the marketplace. As a result, costs for many software products are expected to increase.

Recently, however, several companies have entered the functionality-oriented software market where they are exploiting a niche. For example, one company has developed a product which focuses its functionality on point-of-service (POS) processing. POS has for the most part been ignored over the past several years and has been treated as the "step-child" to ATM transaction processing. This company has "liberated" POS from the confines of ATM

processing, making it a separate service. Customer reaction to the product has been very good, and competition is expected to cause other companies to improve their products to meet the challenge.

Traditionally, there have been a limited number of hardware platforms used for POS processing purposes. This situation is changing. For example, in one situation performance-oriented software is being "ported" (i.e., re-written with the same level of processing functionality) to new hardware platforms. Including more platforms will provide more options for purchasers and will expand the market.

A nationwide EBT system directly benefits from all this activity. EBT system functionality requirements represent a small increment over software currently used in the marketplace. Functionality-oriented and performance-oriented software process with each other through standard interfaces. New platforms provide more options for using existing equipment and for improving the use of existing staffing resources.

Overall, on-line EBT systems based on standard software are technically feasible and can provide the functionality and performance characteristics necessary to meet all system requirements. Therefore, rather than considering technical feasibility, the following sections discuss application software processing characteristics and requirements. The sections are divided into transaction processing, database access, security software, workstation screens, eligibility file processing, and settlement processing.

TRANSACTION PROCESSING

On-line transaction processing in an EBT system comprises financial transactions (i.e., purchase, refunds, voids and reversals), balance inquiries, and manual backup transactions.

Financial Transactions

On-line financial transaction processing includes POS and ATM transactions. All transactions are sent to the authorizer for processing. Because balance information is maintained centrally, all transactions can be processed using current balance information.

Two major standards currently govern financial system transaction processing. One, ANSI X9.2-1980 (being revised) "Interchange Message Specification for Debit and Credit Card Message Exchange among Financial Institutions", provides detailed information on the message formats and flows for financial transaction processing. The second, for standard message formats, is ANSI X9.16-1984, "Standard Formats for Messages Types."

The financial transaction standards are designed to ensure complete and accurate processing of all financial transactions, especially when one institution is not responsible for acquiring, processing and settling a transaction. In small-scale applications it is feasible for one institution to perorm all these functions (as in the Reading EBT demonstration), but larger applications usually involve multiple institutions. Even in the current round of State-initiated EBT demonstrations, financial transactions from ATMs sometimes involve a second network. Financial transactions in a nationwide EBT system certainly will be processed by multiple institutions, so adherence to processing standards will be needed.

Balance Inquiries

Balance-inquiry processing is similar to financial transaction processing. The inquiry must be acquired, passed to the institution maintaining the client authorization file, processed, and returned to the acquirer. Processing balance inquiries, of course, does not involve any changes to account balances.

As previously discussed, several avenues (e.g., audio response units, balance-inquiry-only terminals and ATMs) are available for delivery of balance information. Security over balance-inquiry-processing must be sufficient to protect recipient privacy, particularly when using ARU delivery.

Manual Transactions

An EBT system must be capable of processing manual, backup transactions whenever regular electronic processing is unavailable. Providing this service will require some modification to existing application software.

If electronic processing is not available because a terminal is not working, verbal authorizations can be given when the retailer calls in infor-

mation about the purchase amount and recipient account to be debited. In this situation the software must be able to place a hold on the recipient's account, entered from a system workstation. Once a manual sales slip is received from the retailer, a second workstation entry can instruct the software to complete the processing of the transaction by crediting the retailer's account and settling the transaction. System reconciliation software must maintain separate totals for manual transactions until processed.

If terminals are working but the system's processor or communication lines to the processor are unavailable, the system design could have the terminal store the transaction for later presentment and processing (introducing the risk of insufficient funds being available) or require verbal authorization using a daily printout of recipient balances.[1] The verbal authorization approach would again require application software to accept workstation entries of transaction information. The other approach (often called store and forward, or SAF) is already supported by existing software in some POS networks.

Feasibility of Development Approaches

Application software which can reliably handle transaction processing is available for use with different hardware components, and software choices will expand in the coming years. Therefore, obtaining high-performance software for POS debit transactions should not be a problem.

In the Multiple Design development approach, different sets of application software will likely be implemented in different States. Because different software packages sometimes use different rules for transaction processing, how specific transactions are supported in each State may vary. That is, while purchase transactions will be available in a consistent manner across all sites, voids and refunds may be processed slightly differently depending upon their definition. For example, in some environments processing rules could be in force which allow partial and total voids. These differences in processing will result from inherent differences between the implemented systems. Where there are cross-system recipients, different

[1]The latter approach would be difficult in a system serving more than a few thousand recipients.

processing rules for the same type of transaction may cause confusion until recipients become accustomed to the differences. Under the Standardized and Unitary Design approaches, transaction processing rules are expected to be consistently defined and applied.

In the Unitary approach, the processing of manual transactions may be somewhat more difficult than under the Multiple and Standardized approaches, simply because the system operator will have to handle a larger volume of transactions. The basic approach to handling manual transactions, however, could remain the same in all development approaches.

DATABASE ACCESS

Several databases are pertinent to benefits processing: retailer, recipient, terminal, and transaction log. The retailer and terminal databases record information on those retailers and terminals which have authorized access to the system. The recipient database also includes authorization information, as well as data on remaining balances. The transaction log records pertinent information relating to each transaction processed by the system.

Key technical issues for database access are the ability to update eligibility, security access, transaction processing, and workstation access.

Authorization File Processing

In most cases, authorization file processing is treated as a "positive file with balances." This means the recipient will have a record on file along with associated benefit balances. File update requirements include the ability to add, change or delete records based on information from the State's program eligibility files. These update capabilities might also be included in the States' or local offices' system workstations. A further capability is increasing or decreasing benefit balances on the authorization database.

The complexity of authorization file processing increases as the implementation approach moves toward the Unitary Design. In the State-developed design approaches, the size of the authorization file is determined by the size of the State's caseload. Currency of database information will

usually be quite high, as there will be little competition from other State databases and updates will be performed immediately. The size of these files is expected to range from very small (e.g., about 11,000 records for a New Hampshire system) to moderate (e.g., about 800,000 records for New York). These file sizes will not present significant processing delays due to recipient record access. But, as the number of sites performing authorization processing decreases (as in the Unitary Design approach), consolidation of authorization information requires more processing time and hardware to support file updates and size.

Under the Unitary Design approach, consolidating all authorization processing and using one database presents some interesting technical issues. The authorization database in a centralized Unitary Design system would exceed 8 million records. Other benefit programs added to the database will further increase size.

The size of each record on the database plus the number of records maintained will require a very large database. Although some processing efficiencies can be gained by partitioning the total database into separate sections for each State (or group of States), this increases the complexity of the database structure. Whatever the approach to configuring the database, accessing and updating very large databases can involve significant efforts, representing high costs and possibly increasing transaction response times. Staff required to support these databases are expected to be highly skilled and costly. In addition, supporting staff are expected to be numerous, due to the complexity of the systems necessary to ensure processing integrity, software version control, and backup capabilities.

In the regional version of the Unitary Design approach, each regional processor would be responsible for a particular section of the country. Such an approach reduces the size of individual databases and improves updating and response time characteristics. One drawback with this approach, however, is cross-region processing. While the need for such processing will be relatively small, response times would be expected to increase somewhat for these transactions. Overall, staffing requirements for supporting and maintaining the databases would be about the same, just spread more evenly throughout the country.

While several drawbacks in the Unitary Design approach's database size and processing capabilities are apparent, a Unitary system represents a feasible approach. Several large (but non-POS) systems, each with complex and large databases, are operational throughout the country. Each operates efficiently, but the costs to operate the systems are quite high, in the range of $10 to $20 million per year. Most of these database systems are "home grown" and are therefore unique to their environment. As a consequence, these systems are not transportable and must be re-developed for use in other applications. Staying with standard approaches wherever possible would reduce costs, but the centralized version of the Unitary Design approach would require further research before a clear understanding of its benefits, costs, and implications could be developed.

Security Software

Two types of security are considered under this section: database access and transaction processing. For database access a multi-level, multi-function capability should be in-place and implemented in conjunction with workstation screen processing. Multi-level capability allows the system's security officer to structure the database access tasks for those staff members who have needs for access at particular levels. Multi-functional capability allows the security office to allocate functional responsibility across staff. The security capability should be sufficiently flexible to minimize opportunities for errors of omission or commission.

Regardless of implementation approach, database access security is a critical component of consolidation. As processing consolidation occurs in either the regional or centralized versions of the Unitary model, additional levels of security are required. At a minimum, access by participating organizations and central site access to the database should be included. Segregating information on the database by appropriate agencies allows need-to-know access and preserves recipient privacy.

While technically feasible, security software supporting increased consolidation can become very complex. Increases in software complexity also require increases in the staff's skills to manage the security process. In some cases software may not be readily available to support the levels of security necessary in a consolidated environment, and its development would be a requirement before system implementation.

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Feasibility of Development Approaches

Given the similarities in the functionality required of POS debit card systems and EBT systems, obtaining or developing application software for an EBT system should not pose serious difficulties. This is especially true in the Multiple and Standardized Design approaches, where system size will be comparable to many existing applications of POS software.

As system size increases, however, the application system must be capable of handling greater amounts of data without degradation of performance characteristics. As mentioned in the earlier discussion of central site processing, a single processing center would have to be capable of processing over 200 transactions per second in a nationwide EBT system. Not only is the technical feasibility of handling this volume of transactions over a sustained period in question, there is really no need to do so. By dividing the processing responsibilities of a Unitary system among regional processors, peak transaction volumes can be reduced to a more manageable level. Industr representatives indicated that current POS networks operate more in the range of 50-60 transactions per second, or 10 to 15 million transactions per month. For a nationwide EBT system, these numbers suggest that from 4 to 7 regional processors would be needed in a Unitary system. Regional processing could also provide the capability for backup of other regional centers should processing be lost in one. In addition, smaller databases at the regional sites would allow for quicker access for workstation screens, transaction processing, and eligibility and balance updates.

4.3 SPECIAL FOOD STAMP PROGRAM REQUIREMENTS

While EBT processing is similar in many ways to commercial POS services, there are a number of unique Food Stamp Program requirements for an EBT system. These requirements include manual transaction processing, immediate benefit availability, and special reporting requirements.

MANUAL TRANSACTION PROCESSING

When electronic processing of POS transactions is unavailable in commercial systems, customers usually can use cash or check to complete the transaction. Alternatively, they may be able to wait until a later time to

make the purchase. In an EBT system, program recipients depend on their benefits and may not have alternative sources of funds. In addition, they may not be able to delay purchase of groceries until the system is once again available. Thus, to preserve recipients' access to their program benefits, an EBT system must allow manual processing of transactions when electronic processing is not available.

If the retailer or EBT system operator is willing to accept the risk of accepting transactions which later cannot be authorized due to insufficient funds, one approach to manual processing is to store transaction information in the terminal for later transmission to the system. If this risk is unacceptable or the terminal is not operating, the retailer will have to call the system operator for verbal authorization. The system operator can check the recipient's balance if the system's database is accessible, or use a recent printout of balances if the database cannot be accessed.

Manual transaction processing is technically feasible in any implementation of an EBT system. As discussed in Section 4.2, the application software must be modified to allow workstation entry of transaction information.

Manual processing, however, does present some operational difficulties. In a high-volume environment, providing sufficient staff to authorize transactions will be difficult and costly. This is especially true in the centralized Unitary Design approach. One cannot realistically expect verbal authorization of 200 transactions a second if the central database is inaccessible during a peak shopping period.

From the retailer's perspective, the least disruptive approach would be to include a handset on each terminal. If the system was inaccessible, the store clerk could use the handset to call for verbal authorization. This approach is used in the Reading demonstration system. Adding handsets will increase terminal costs somewhat, however, and is technically feasible only in a dial-up environment. Where leased lines and a communications controller are used (e.g., in multi-lane stores with high EBT volumes), the recipient would have to go to a service desk for the call to be made.

While technically feasible, it is clear that providing *manual* processing capability is cumbersome and costly to all parties. For this

reason retailers and system operators may resist its implementation. Nevertheless, it is a critical requirement for any EBT system, and a system developer will have to work with FNS and participating retailers to structure a manual processing system which is acceptable to all parties.

SPECIAL/EMERGENCY ALLOTMENT PROCESSING

Most program benefits in an EBT system will be authorized and posted to recipients' accounts on a monthly cycle. In some situations, however, benefits must be delivered within five days of application for benefits. Given the time needed to verify the applicant's eligibility and to authorize the benefit allotment, little time may be available to post benefit authorizations to an EBT database.

To meet the posting deadline, special procedures may be needed. For instance, welfare office staff could use workstations to post benefits to the database. The system's application software would have to support this administrative function. In addition, appropriate security and control procedures would be needed to prevent abuse of this workstation functionality.

Dual custody controls over access to these workstation screens would be appropriate. In addition, operational control procedures would be required to ensure that updates via the workstation screens were also reflected on the master eligibility file maintained by the appropriate program and agency. Finally, the system would have to provide reports detailing all workstation-entered allotments to support system reconciliation and auditing.

FOOD STAMP SPECIFIC REPORTS

Food stamp processing reports will be required regardless of model and development approach. Standard POS reporting software is generally unavailable to meet the specific reporting requirements of the Food Stamp Program. So these reports, while technically feasible, must be developed and implemented. Program administrators must define report requirements. In the case of the State-developed designs, the State Agency has this responsibility within the guidelines provided by FNS. For a Unitary system, FNS will play a much more active role, but local administrators may be involved in defining appropriate reports to meet their specific needs.

Two options exist for the generation of required reports. First, the system vendor--with direction from State or Federal officials--could develop and integrate the reporting software with other EBT application software. The vendor would then generate and distribute all necessary reports. Second, the vendor could transmit all transaction log data to the State or Federal Agency. The Agency could then analyze the data and generate the required reports. The latter approach has the advantage of flexibility (i.e., the State or Federal Agency could easily generate new reports without asking the vendor to develop new reporting software), but it places more responsibility on State or Federal data processing resources.

4.4 INTERCHANGE FEASIBILITY

Current Food Stamp Program policy provides recipients with the choice of shopping at program-authorized retail outlets regardless of geographic location. Food stamp coupons easily allow recipient mobility. Without sufficient forethought, however, recipient mobility could be seriously restricted in an electronic environment. Mobility can be preserved if interchange is allowed. This section discusses the technical requirements of transaction interchange between two EBT systems and the feasibility of interchange within each development approach.

TECHNICAL REQUIREMENTS

Transaction interchange requires the acquiring and issuing EBT systems to communicate with each other for processing and authorization of an electronic transaction. In a commercial POS system, funds must be passed between the two systems for retailer crediting. Because all Food Stamp Program benefits in an EBT system are provided by the U.S. Treasury, interchange will not require the actual transfer of funds from one system to another. To ensure balancing of each system's accounts, however, information about retailers' interchange credits must be passed to the card-issuing system.

Card number standardization is the first step to interchange. Standard card numbers provide the basis for an authorization system to identify and route "foreign" transactions to the appropriate destination. While card number standardization is technically feasible and standards (ANSI)

exist, establishing a card number convention will require national focus and support.

Standard processing formats used for passing transaction information between processing centers is the second step to interchange. Several standards are available. One is the ISO X9.2 message formats. Another message format standard is Format 8, maintained by application software vendors. Any or all of these standards would be appropriate for message formats and flows.

Settlement processing between the systems is the third and perhaps most important interchange requirement. In a non-interchange environment, funds are transferred from recipient accounts to retailer accounts within a single processing system, and they are posted via ACH. When processing between systems, the systems must balance and settle between themselves to keep the accounting correct. Policy guidelines governing this process need to be developed. Examples of cross-system settlement could include using a clearing account, such as "due to/due from" accounts, or establishing the same dummy ACH account for clearing purposes by all participating systems.

INTERCHANGE WITHIN EACH APPROACH

Regardless of development approach, interchange occurs when a recipient from one system receives transaction authorization at a terminal serving another system. Behind the scenes, the recipient's transaction is recognized as belonging to another system and routed to that system for authorization. Later, at completion of the business day and during settlement processing, funds are transferred from the recipient's account in one system to the retailer's account in a different system area.

State-developed systems in the Multiple Design approach pre-suppose no interchange in most situations. Two States using the same application software vendor is the only condition where one could expect interchange. While there is understandable reluctance at the national level to select and enforce standards, maintenance of recipient mobility may require national direction. Selecting common interchange card numbering for routing purposes, common message formats and flows for authorization purposes, and settlement for transfer of funds between systems will require national attention and focus. Without this attention, system evolution will preclude future interchange capabilities.

In the Standardized Design approach, the presence of design standards will facilitate interchange. Each State's vendor, however, would have to work with other vendors to coordinate interchange processing and settlement. That is, a standardized design ensures the technical feasibility of interchange, but additional agreements among vendors must be reached.

Almost by definition, interchange is possible within the centralized version of the Unitary approach. Because all participants are settled by a single processor, interchange occurs "automatically." In the regional Unitary system, regional interchange will be required. As in the Standardized Design approach, the regional vendors will have to establish rules among themselves to ensure interchange. Of course, the number of vendors involved would be much smaller, allowing easier coordination.

Reasonably, time lags are expected in the interchange process. For instance, a retailer's account could be credited one or more business days before debiting of the recipient's account. Due to the existence of time lags, efficient interchange depends on the availability of settlement funds. That is, the settling institution may have to provide funds to retailer accounts before recipients' funds are available from the U.S. or State Treasuries, depending upon benefit program. States must be prepared to accommodate and negate the effects of this float.

In the current EBT demonstrations, participants have raised issues regarding the funding of settlement dollars. On a nationwide basis, funding settlement dollars in the interchange process becomes an even thornier issue. Funding the float requires a change in policy which will allow one day's worth of processing to be banked in a "due to" account. All system vendors would then draw from the account on a daily basis, and it would be reimbursed on the following day from the settlement/interchange funds from the previous day. The total cost for this process is the lost float on one peak day's funds, which could approach $5 million at a 5-percent opportunity cost of capital.

4.5 INTEGRATION WITH CREDIT CARD NETWORKS

A nationwide EBT system would require deployment of about 577,200 debit card terminals in program-authorized stores. Furthermore, an extensive telecommunications and processing network is required. Establishing the necessary infrastructure for a nationwide EBT system clearly will be expensive.

The credit card industry in the U.S. is much more mature than the debit card industry. A telecommunications and processing infrastructure is in place, and more than 800,000 credit card terminals have been deployed. A natural question is whether a nationwide EBT system could be integrated with existing credit card operations, thereby reducing costs.

In some respects integration could be achieved relatively easily. For instance, telecommunications networks supporting the credit card industry are not restricted to that application. Public or private communications networks provide services to a variety of users, and an EBT system would merely share in usage of an established infrastructure. While some additional lines and linkages would be needed, existing services would form the base of telecommunications support for an EBT system (as they do for credit card systems).

Integration of switching and processing centers is also feasible and has been done by some organizations. The functional requirements for switching and processing credit and debit transactions are similar. The major difference is that debit transactions require PIN processing (including PIN encryption and de-encryption), which does add a substantial level of complexity. As noted earlier in this chapter, however, PIN processing capabilities are available in some credit card networks, even though they generally are not used. Thus, integration is technically feasible. Indeed, nothing would prevent credit card switches or processing organizations from bidding on contracts to become EBT vendors, thereby integrating credit and debit services.

The biggest problem with integrating credit and debit card applications is the terminal base. While it is technically feasible for a single terminal to handle both credit and debit cards, few of these terminals currently exist. First, the terminal must have a function key to differentiate between credit and debit transactions, or the access card must indicate which type of transaction is being requested. Most deployed credit card terminals do not have the required function key, although newer models often do. With respect to access cards, the industry trend is in the opposite direction. That is, some institutions are now issuing cards which can be used in either credit or debit terminals. Thus, while movement towards combined credit/debit terminals exists, it may take some time before the installed base is very large.

One reason for the anticipated slow deployment of combined terminals is the requirement that debit-capable terminals have PIN pads and receipt printers. The estimated cost of adding a PIN pad and related software is about $300 per terminal, and a receipt printer could add several hundred dollars more to the conversion cost.[1] By comparison, the estimated average cost to deploy and install a complete debit card terminal set is about $900 (see Chapter 8). Thus, while conversion costs are substantial, conversion of existing credit card terminals could still save an average of $300 to $400 per terminal.

Terminal conversion, of course, is possible only when credit card terminals already have been deployed. This introduces another major impediment for an EBT system. Although 800,000 credit card terminals have been deployed, very few have been deployed in retail food stores authorized to participate in the Food Stamp Program. The reason is that the food retail industry operates on slim profit margins, and most food retailers cannot afford the discount fees charged on credit card transactions.

Thus, while technically feasible, attempts to use the infrastructure in place for credit card applications are not likely to generate large savings for implementation of a nationwide EBT system in the near future. This situation could change, however, if food stores begin accepting credit cards. As of now, no major trend in that direction is apparent.

4.6 SUMMARY OF TECHNICAL FEASIBILITY

A nationwide EBT system using on-line processing is technically feasible under each of the three development approaches. For the most part, a nationwide system would build upon existing hardware, software, and telecommunications capabilities.

From a technical perspective, the Multiple Design approach would be the easiest to implement. The result would be numerous independent EBT systems which would operate very much like existing commercial debit card systems. With current hardware and software configurations, the size of these

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[1] POS News, "Draft Capture Begins to Fuel Debit Growth," Vol. 5, No. 7, January 1989.

systems would be quite manageable. Their major drawback would be the lack of an assured interchange capability.

The Standardized Design approach seeks to overcome the interchange limitation by imposing design standards on State-developed systems. Because current debit card systems support interchange, the technical feasibility of interchange is not in question.

The Unitary Design approach to implementing a nationwide EBT system does pose some technical challenges. In the centralized version of this approach, the system's processor will need to handle perhaps as many as 6 million transactions a day during peak periods of the month. In addition, the recipient database would include over 8 million records. While a hardware and software configuration capable of handling a system of this size could be developed, the resulting system would be very complex. Further technical complexity would be required to maintain performance levels, telecommunications support, and system security. Finally, the staff support required to manage and operate such a system would be much higher than in smaller-sized systems.

The complexity introduced by a centralized unitary system is really unnecessary. Because the vast majority of transactions coming from terminals in a single State will need to be processed only against that State's portion of the national database, a centralized system introduces many inefficiencies in system design and operations. Many of the benefits of a Unitary system (e.g., FNS' provision of a processing infrastructure that individual State Agencies can tie into) can be achieved with regional processing. Regional processing, in turn, reduces database size and processing volumes to a level where system capacity and operations is more efficient. At least 4 to 7 regional processing sites would be needed to reduce processing volumes and database size to levels more in line with most existing networks.

A recurring theme throughout this chapter has been that a nationwide EBT system should build upon standards already developed within the POS and ATM industries. These standards should be adopted regardless of the selected development approach for an EBT system. Adherence to existing standards will provide many benefits. First, it will facilitate the integration of an EBT system with existing POS and ATM networks. This should reduce EBT system development and implementation costs and promote a public/private partnership

in the delivery of program benefits. Second, building on existing standards will provide a design environment in which interchange is possible. If existing standards are not adopted, Federal Agencies still will have to specify a set of standards to achieve interchange, and this effort will be redundant and wasteful. Third, adherence to existing standards will allow future changes in implementation strategy to be accomplished at less cost. For instance, if all States adhere to the same standards, implementing a Unitary system at a later date could be accomplished without total redesign of existing systems.

Applicable standards have been presented throughout the chapter. Industry standards for management reports have not been developed, however; such standards should be developed for an EBT system. The standards could cover reporting requirements for Federal, State, and--where appropriate--County use. Typical data requirements would include program information; processing and performance information (e.g., transaction volumes, response times, and processing and terminal availability); audit information; and settlement and reconciliation information.

Chapter Five

PERFORMANCE ISSUES

Broadly defined, system performance covers issues related to the quality of service provided by a POS system. System availability and response times are two components of performance that receive considerable attention in the marketplace. Factors affecting these components are the reliability of system components (including deployed terminals) and system processing speed. Other performance characteristics are processing accuracy and the timeliness and quality of on-site terminal repair.

Although developers of POS systems may focus initial attention on system functionality (i.e., the services to be provided), user acceptance of electronic debit card systems depends, in large measure, on the systems' performance characteristics. Achieving high system performance is not a one-shot effort. Maintaining on-going performance levels requires continual attention to system activity levels, the capacity of individual system components, and the efficient use of that capacity. Maintaining high performance also requires an organizational framework that emphasizes timely response to the needs of the system user, whether that user is a retailer, a card user, or a State or local welfare agency.

The POS industry has not established industry-wide performance standards, even though some fairly common expectations about acceptable performance have developed. Resistance to establishing a common set of standards has come from network participants and operators, each opting to set its own performance criteria or letting the marketplace establish de facto standards. Individual network standards are defined in most networks' by-laws for their participants but, in many cases, are not strictly enforced. Common standards and strict enforcement are expected to occur as network consolidation increases and factors differentiating competing networks, such as different services, become fewer.

Performance factors and their importance to an EBT system are the focus of this chapter. The chapter begins by discussing system availability and the reliability of individual system components. Section 5.2 discusses response times. Section 5.3 examines processing accuracy as a component of performance. Because system performance is often affected by the volume of

processing activity, Section 5.4 discusses activity levels and system capacity. Section 5.5 discusses customer service as a performance component.

For purposes of simplicity, only draft capture authorization is considered in this chapter. In draft capture authorization, all data about a transaction are transmitted electronically between terminal and host. Other types of authorization are on-line authorization with paper draft capture and voice authorization with paper draft capture.

5.1 SYSTEM AVAILABILITY

From a system user's perspective, system availability refers to whether or not a requested system action (e.g., authorize a transaction, settle accounts, add a new account to the database) can be completed. Because an EBT system will have multiple types of users, different concepts of availability exist. For instance, retailers and recipients will expect the system to be available 24 hours per day, 7 days per week. Welfare office staff will view availability primarily in terms of normal business hours, or 8 hours per day, 5 days per week. Consequently, measuring availability in a multiple user environment is difficult.

Usually, minimum availability requirements are defined as service level objectives (SLO). Because availability requirements are more stringent during different times in the processing day, an SLO may be structured into multiple processing layers, each measured or monitored separately. Typically, three SLO measurement periods should be considered: the entire processing day, prime time and peak time. The entire processing day covers the entire period over which processing occurs (i.e., 24 hours per day, 7 days per week). Prime time frequently designates a period of time when transaction processing and account maintenance occur simultaneously (i.e., the period from 8 a.m. to 5 p.m). Peak time covers the period of the day when processing volume is highest. Usage patterns and geographic coverage must be considered before appropriate peak and prime times for processing are identified. System capacity is usually built to accommodate the processing requirements during peak times. Availability measurement and system users' perceptions are most directly affected by the ability of the system to process during peak periods, when the system is most stressed and likely to fail.

Usually, one or more of these measurement periods overlaps with another period. Interestingly, these processing period windows widen as the system's geographic coverage increases. For example, in a multi-state, two-time-zone regional EBT system, the peak time period is likely to increase from a three- to four-hour period to a four- to five-hour period. In a national system with one vendor, the system's peak period will extend to six to seven hours each day.

Unscheduled system outages clearly affect availability. Performing routine system maintenance in most environments, however, requires periods of scheduled outage, when the system is removed from service and no processing activity may be performed. Usually, scheduled outages are predetermined periods which occur at the same time during the processing week or month. Sunday from midnight to 4 a.m. is frequently used for this purpose.

Scheduled outages normally are acceptable processing practices. If a system relies on a national processor, however, scheduled outages may not be acceptable. For instance, a national switch in the West, having scheduled outages in the early morning hours, may adversely impact customers using the service in the East.

In some cases national POS networks do not differentiate between scheduled and unscheduled outages, thus all outages reduce availability. While not an official national standard, most networks have contractual availability requirements for each member and, in some cases, are allowed to enforce the standard with financial penalties. Members also may be required to post performance bonds to deter problems with system availability. In most situations, however, members are encouraged to meet availability requirements using other means (e.g., discussing poor availability performance with members during network board meetings, offering technical suggestions for improvement, publicizing each member's availability ranking). With increased competition for POS services, the use of financial penalties may increase soon to improve performance.

High levels of system availability (above 97 or 98 percent) have

bility should be a major performance goal of any EBT system, regardless of development approach.

To monitor system availability, an EBT system operator should be required to maintain logs of when the system cannot process transactions, and these logs should be reviewed by State Agencies, or by Federal Agencies in a Unitary EBT system. State Agencies should maintain logs of when an EBT system cannot be accessed for administrative functions (e.g., adding new accounts to the database or checking transaction histories). Unfortunately, no easy method exists for monitoring the availability of POS terminals. Retailers could be asked to maintain logs of when terminals are not working, but this would be time consuming. A more feasible approach might be to monitor the number of service calls retailers make for equipment malfunctions. Finally, the percentage of EBT transactions requiring manual authorization also can serve as an indicator of the relative incidence of system unavailability. In the extended Reading EBT demonstration, an established goal was that no more than 0.3 percent of all transactions require manual authorization.

In seeking to maximize system availability, the reliability of individual system components must be considered. Each network component (e.g., terminals, telecommunications lines, processing units, application software) represents a potential point of failure. If any single component fails, the system becomes unavailable to some or all users.

In most networks or systems, sufficient redundancy is available to limit the impact of a point of failure. The weakest point in any system or network occurs where redundancy is either too costly, overlooked in developing the capability, or impossible to provide. Often these weaknesses are referred to as "single points of failure." Because all transaction processing activity passes through these single points of failure, they represent the greatest risk to network reliability and availability. Examples of such vulnerabilities are telephone lines, computer hardware, system and application software, and electrical supplies.

Technological solutions are available which improve overall reliability. Computer hardware platforms have been developed to provide virtually continuous periods of operation through the use of specialized system software and redundant hardware. Using these platforms, application software has been developed which provides for increased availability by integrating with the system software and platform hardware.

Of the three development models, system reliability should be highest in the Multiple or Standardized Design approaches. These approaches develop systems with limited geographic coverage (i.e., one State), so their required telecommunications infrastructure is simpler. In addition, database structure and access are less complex than in a centralized or regional Unitary system, which should reduce the number of problems encountered and the time to correct them.

In the Unitary Design approach, regional systems are likely to be more reliable than a national system. Regional processing requires less complex processing and telecommunications support than a national processing center. Also, if regional processing centers are used, the possibility exists that if one center suffered a prolonged failure, its database could be transferred to another regional processing center for temporary processing.

5.2 RESPONSE TIME

Closely following availability as a performance goal is system response time. High system availability is expected. Quick system response time within very narrow tolerances is another requirement. Response time is the time measured from the terminal's submission of the transaction until receipt of the approval or denial response. While there are other views of response time, discussed later, this is the user's view and is often referred to as "end-to-end response time."

For reasons not totally clear, users will tolerate higher response times on manual payment processing than on electronic payment processing. Many theories have been advanced for this phenomenon, all plausible. The lack of human interaction while electronic processing is in progress seems to be the most reasonable. In many cases, POS response times of 5 to 10 seconds are expected. Total ATM processing times are higher, but only because an ATM transaction requires multiple interactions with the system (i.e., the transaction involves several prompts for customer information, and each requires a system response).

In some situations where processing times have increased slightly, user dissatisfaction has resulted. One recent example at a large financial institution's ATM network was the introduction to the network of a new ATM with enhanced functionality. Customer complaints were voiced immediately over

slower response times at the newer ATMs. In locations where the older, faster machines were side-by-side with the newer ATMs, longer lines developed behind the older ATMs--a vivid example of customer reaction to a slower response time situation.

There are no national standards for system response times. Instead, response time criteria tend to be defined by network operators or by service providers. This is especially true in larger networks such as Visa or MasterCard, where membership size is so great that the network operator (and not the members) must dictate response time criteria to ensure smooth operations. In emerging POS networks, these larger networks' standards may be accepted as industry norms. For example, many networks require authorizers to respond within a defined period of time or face financial penalties. The specific criterion for maximum response times varies somewhat from network to network. Five seconds or less for this portion of the overall transaction seems to be the norm.

End-to-end response time (i.e., from transaction submission to receipt of response) is affected by three major network components: telecommunications transmissions, switch processing times, and authorizer processing times. Processing times, in turn, will be affected by hardware capabilities, systems and application software, and database access. If end-to-end response times are too long, the system operator needs to know which components are responsible. Thus, managing end-to-end response times in a POS or EBT network requires the operator's ability to measure response times in each component.

The most control a network operator has over response time is through the telephone network and in the application system. By increasing transmission speed through the telephone network (using higher baud rate modems on terminals), response time can be reduced. Adding telephone lines or computer hardware capacity also can reduce reponse times in some applications. If a retailer's POS terminal uses dial access with pulse dialing, response time can be substantially reduced by switching to tone dialing, if available. Response time can also be reduced by switching from dial lines to leased lines, although leased lines are generally more expensive.

Switch processing time can be measured using software which timestamps transactions as they enter and leave the switch. Where all

authorization processing is performed by the switch, the difference between arrival and departure timestamps is the switch processing time. Where the transaction must be routed to an external party for authorization, two response time measurements are possible. One is the switch transit time (i.e., the time of transaction transit through the switch) while the other measurement is response time from the external authorizer.

In most cases this information is sufficient to measure overall switch processing time. Switch statistical information, however, is not an exact measure of switch processing times when transactions pass through multiple switches. As described below, response times through individual switches can be used, after adjustment, to derive meaningful response times.

Deriving switch processing time measurements requires using switch response times for transactions processed with the individual networks. Summing response time for two networks and deducting average switch transit time for all transactions processed provides total switch processing time for the two networks under consideration. Deducting average switch transit time eliminates the double counting of switch transit time. While this derivation process lacks some precision, it is nevertheless indicative of overall response time and can be a useful tool for determining the capabilities of processing capacity.

When switch processing times are too long, response time can be reduced by "tuning" the application or removing processing bottlenecks. For instance, very fast processing capabilities may not reduce response time if access to the database is slow. Improving response time in this situation would require better access capabilities rather than increased communications or processing capacity.

There are no industry-wide standards for switch processing time. The primary rule-of-thumb is transit time through the switch. Frequently, switch transit time is expected to be one quarter of a second (250 milli-seconds) or less. Most application packages available in the marketplace strive to meet or exceed this requirement.

Purchase of software packages is usually done with vendor assurances of transaction transit time through the switch. Vendors will provide benchmark information which addresses transit times. In many cases these

benchmarks are accurate, but they can be misleading. Because expected transaction mixes (e.g., the mixture of purchases, balance inquiries, issuance postings, database updates) cannot be determined in advance, benchmarks rely on standard transaction mixes. Benchmarks relying on standard transaction mixes may be a poor measure for EBT transaction mixes, so benchmark results cannot be used as the basis for accepting vendor claims of performance capabilities. Vendor benchmarks, where possible, should be adjusted to reflect expected EBT transaction processing mixes.

Normally, end-to-end response times can be expected to increase as the path length and number of transition points in the telecommunications network increases. Thus, longer response times would be expected in the Unitary Design model and in the Standardized Design model (but only for interchange transactions in the latter model). Nevertheless, some things can be done to reduce the impact of path length and transition points. For instance, leasing higher quality lines, increasing line speed, and using higher level line protocols will contribute to improving response time in networks of increasing complexity. All of these contributors, however, are subject to increased installation and on-going maintenance costs.

Response time criteria should be established for any EBT system. The operator's ability to measure response time through key components should also be required. In the Multiple Design approach, FNS could specify some general response time criteria, while letting State Agencies and vendors negotiate exact requirements. Because system designs would be more uniform in the Standardized Design approach, FNS would be in a better position to set a national standard for response time. In the Unitary Design approach where FNS negotiates directly with one or more vendors, response time standards could certainly be set. A standard between 10 and 15 seconds would be realistic, although retailers have been pushing for response times of 10 seconds or less.

5.3 SYSTEM ACCURACY

Accuracy of system processing is a critical factor in system operations, regardless of development approach. At a minimum, processing errors will increase system operating costs and impose extra burdens on system participants as efforts are made to identify and correct errors. If errors go undetected, they will lead to financial losses to participating recipients,

retailers, or the program itself. Any reductions in program accountability resulting from processing errors will have severe consequences for the government's support of future EBT operations.

Processing accuracy requires the processing system to ensure all transaction processing is delivered to the point of origination without error. Every component in the system must provide guaranteed delivery regardless of circumstances. Financial transactions require 100 percent accuracy or full identification and timely resolution of any errors. Without this high level of service, customer confidence will be adversely effected.

Data integrity requires that all database changes via transaction or workstation processing be completely verified. Verification includes checks on card, cardholder, and account validity as well as balance validation and balance reduction by the transaction amount.

Processing integrity ensures transaction accuracy as it passes through each component of the delivery system. Transaction delivery to the authorization point and back to the origination point must accommodate breaks in the process to ensure processing integrity. That is, when breaks in the process occur, appropriate processing must be activated to reverse all activity completed prior to reaching the breaking point. Without reversing this activity, a customer's account could be erroneously updated without receiving approval for the activity requested.

Application software which ensures accuracy throughout the entire processing cycle is available in the marketplace for transaction processing and database integrity. Such application software is available on two major hardware platforms, IBM and Tandem, from a variety of software vendors. Tandem application software has been in use for a longer period, and it dominates the marketplace and marketshare.

Systems with a larger number of components are more complex and therefore require more attention to accuracy considerations. Thus, system accuracy will be more difficult to achieve in the Unitary Design approach than in either the Multiple or Standardized Design approaches. Even in large, complex systems, however, the technology exists for ensuring accuracy and the integrity of all databases and system processing. The cost to achieve this accuracy, however, may be high.

5.4 SYSTEM VOLUMES

System performance can be degraded as the volume of transactions increases and capacity limits are reached or exceeded. Thus, the purchase of software packages for any EBT system should carefully consider the impact of expected system volume on processing functionality. Some packages available in the marketplace, while having impressive benchmark results and strong recommendations from current users, are inefficient and cannot effectively process high volumes. These inefficiencies often do not become readily apparent until processing volumes increase. Corrections for poor performance are either costly or impossible to make.

Before an EBT system is designed and developed, the vendor needs to estimate expected future usage of the system. This may be easier in an EBT environment than in commercial POS networks, because the number of expected users is well defined and the EBT demonstrations will provide evidence of usage patterns (e.g., recipients in the Reading EBT demonstration average about eight transactions a month).

Once future transaction volume is estimated, the vendor should estimate peak volumes on a daily, hourly and per second basis. Again, the EBT demonstrations should provide ample evidence for these estimates. As an example, peak hourly volumes in Reading usually are 11 to 13 percent of daily volumes. Daily volumes are directly related to the monthly issuance cycle.

It is especially important that processing volumes be carefully considered in the Unitary Design approach. Whether regional or central processing is used, volume estimates and benchmark information are particularly important in the decision making process. Very few software packages can process the volumes one would expect in the centralized Unitary Design approach, and detailed understanding of processing capabilities of purchased packages and of actual production processing situations should be reviewed carefully.

Understanding and addressing volume patterns is also crucial to switch processing. During the course of a processing period such as a week, month or year, volumes will vary by as much as 25 to 50 percent against the average volume. For example, in some systems summer travel activity will

cause more usage by customers than at other times of the year. In an EBT system, volumes will be high around issuance periods. Dampening these EBT peak volumes can be accomplished by staggering issuance periods throughout the month, thereby reducing overall system capacity requirements.

Capacity through each major component of the system must also be considered. Each system component at a given point in time is capable of processing different levels of volumes. For instance, telecommunications capacity and protocol may be capable of 25,000 transaction per hour, the hardware capacity may be capable of 70,000 transactions per hour, and the application software may be capable of processing 12,500 transactions per hour. The overall capacity of the system is the processing capacity of its least capable component--or the application software in this example. So, all components of the system should be considered in estimating the processing capability of the system.

Insufficient capacity in any area may cause performance degradation in other components. In the previous example, when the volumes exceed 12,500, the application system response time will deteriorate. Response time deterioration may cause reversals due to late responses to the original transaction. Reversals are treated by the application in a manner similar to regular transactions. Thus, reversals increase transaction volumes even further and cause further deterioration. In many cases as reversal processing increases, system processing can degrade so badly that system processing could possibly stop. Sufficient system capacity in all areas must be provided to ensure performance is not adversely affected.

Overall, capacity considerations require analysis of the processing capabilities of all system components. Selection and purchase of vendor-developed application software includes the platform upon which the application will operate. Telecommunications access to the platform and application software require careful consideration of possible volume growth over a several-year period to ensure sufficient capacity is purchased and added to support the future. Failure to carefully consider these areas will require painful adjustments as volumes grow and software or platform inabilities to process become apparent.

5.5 CUSTOMER SERVICE

Any POS or EBT system will encounter problems which affect customer usage of the system. Lost, stolen or damaged debit cards will need to be replaced; faulty terminals or other in-store devices will need to be serviced; and transactions will have to be manually authorized when electronic processing is unavailable. In addition, disputes over account balances or transaction totals will need to be resolved. A very important component of overall system performance is how quickly these problems can be corrected.

It is important to note that the identification of customer and service provider may vary depending on the nature of the problem. State and local office staff will often be system users or "customers," as when they use system workstations to update an EBT system's database. These staff are also "service providers" when they train recipients, issue new debit cards, respond to account problems, and the like. Thus, maintaining a high level of customer service in an EBT system is the responsibility of both the system operator and State or local office staff. Each party will have to acknowledge its service responsibilities and work together to maintain customer service levels.

Because terminal problems cause major problems for retailers and their customers and require costly and time-consuming manual authorization procedures, terminal servicing is a very important component of customer service. Responsibility for terminal servicing usually rests with the terminal deployer (or transaction acquirer), although the deployer may contract with a separate vendor for provision of these services. It is not unusual for these contracts to specify maximum allowable response times for service calls. As more stringent response times are specified, however, contract costs can be expected to rise. Given the importance of terminal operators, a maximum response time of two to four hours is reasonable.

Operation of a telephone "hotline" for retailers and recipients to call when problems are encountered is another important service component. An EBT system may have multiple customer service hotlines. Recipients could call their local assistance office to report lost, stolen or damaged cards or to inquire about account problems. During non-business hours these calls could be forwarded to a representative of the system operator. Retailers could call their terminal deployer about account or equipment problems. Local office staff should also have a number to call if problems develop with system work-

stations or database access. Finally, retailers will need to call a system representative to obtain verbal authorization for manual sales.

5.6 SUMMARY

Successful operation of an EBT system requires close attention to many components of system performance. The availability of system processing and system response times are two critical areas of system performance. Other important areas are processing accuracy and customer service.

System availability, response times and processing accuracy are directly affected by system design decisions. The design must be based on appropriate telecommunications, hardware and software configurations, and the capacity of these components must be sufficient to handle expected peak volumes of transaction activity. Because performance is related to design issues, however, it is easy to overlook the impact of operating procedures on system performance. Maintaining system performance is an ongoing task. Increased transaction activity, degraded line quality, and equipment failure can all affect system performance. The system operator needs to constantly monitor these components and measures of performance to ensure that required levels of performance are maintained. Equally important is Agency oversight of system performance, through review of performance measures and attention to retailer and recipient complaints.

System performance is harder to maintain as the complexity of the system increases. Thus, system performance levels in a regional or centralized EBT system are likely to be somewhat lower than in systems operating at a State level (i.e., those developed under the Multiple or Standardized Design approaches). This is especially true in the areas of system availability and response times. Similarly, performance in a centralized EBT system will be harder to maintain than in the less complex regional systems. This does not mean that regional or centralized EBT systems cannot provide adequate levels of system performance, only that more effort will be required to achieve the same levels of performance as in State systems.

Chapter Six

REGULATORY ISSUES

Implementation of a nationwide EBT system will require changes in Federal legislation and Food Stamp Program regulations. State Operating Guidelines also will have to be revised to address this benefit delivery approach. This chapter reviews existing Food Stamp Program regulations and discusses changes needed to implement each of the three development options described in this report. It also outlines the potential impact of Federal and State laws on the design and operating environment of an EBT system.

6.1 FOOD STAMP PROGRAM REGULATIONS

The Food Stamp Act of 1977, as amended, and program regulations state that Food Stamp Program benefits be issued in the form of food stamp coupons. Alternative methods of issuing benefits are allowed only in defined circumstances or under demonstration authority. Thus, any expansion of an EBT system to non-demonstration sites will require both legislative and regulatory changes. Indeed, Congress is currently examining amendments to the Food Stamp Act which would authorize EBT systems as an alternative issuance and redemption approach.

Required changes could be relatively straightforward. The Food Stamp Act could be amended to allow benefits to take the form of electronically stored data in a program-authorized data processing system. Minimum required changes to program regulations would be a little more substantial. The regulations currently use the term "coupons" when referring to benefits, and these references would have to be broadened to incorporate an EBT system's electronically stored data. In addition, the regulations would have to identify an EBT system as an allowable option for benefit issuance and redemption.

Because existing food stamp regulations contain substantial detail on the general principles and specific procedures for issuing food stamp coupons, however, it is possible that FNS will want to establish similar parameters for electronic systems. This will require more substantial regulatory changes. For instance, FNS could adopt regulations which specify the basic functions that an EBT system must perform. These regulations would be needed regardless of which development approach was selected. If FNS wishes

to pursue either the Standardized Design or Unitary Design approach, the regulations should also specify system design parameters. If desired, system performance requirements also could be included in the regulations. Additionally, FNS could elect to draft regulations which delineate acceptable delegation of EBT responsibilities to private contractors, and define State liabilities that result from financial losses incurred by EBT systems. Finally, the regulations might address issues of how terminal costs might be shared with retailers when terminals handle both EBT and commercial POS transactions. Each of these options is discussed below.

BASIC FUNCTIONS

FNS regulations outline basic functions which must be performed by each type of coupon issuance system (e.g., ATP, direct mail and Household Issuance Record). For an EBT system, similar regulations will assist States by providing standard guidelines which can be used to delineate acceptable EBT operating parameters. The basic functions an EBT system will have to perform include:

- providing benefit allotments to recipients;
- allowing recipients to use their allotments;
- crediting retailers for benefits they accept;
- ensuring fiscal accountability; and
- providing management information.

Regulations might simply mandate that these functions be performed. However, if FNS seeks to maximize conformity across the Food Stamp Program, it might establish more specific methods and standards for discrete functions.

Provide Benefit Allotments to Recipients

In the current system, recipients have their benefits once they receive an allotment of coupons. Recipients in EBT systems never actually take physical possession of their benefits. Instead, benefits are electronically posted to a computer account, and the recipient is issued an EBT card which can access the benefits stored in this account. Thus, FNS could draft regulatory guidelines which address these and related functions. Regulations might stipulate that an EBT system must:

- provide regular monthly benefit allotments to households' EBT accounts on or about the same day each month;
- provide expedited service and supplemental or pro-rated allotments on an as-needed basis;
- issue access cards in a timely manner upon certification for eligibility;
- issue replacement cards in a timely manner when access cards are reported as lost, stolen or damaged;
- provide adequate training to participants who are unfamiliar or uneasy about electronic system technology; and
- establish procedures that enable recipients to designate family members or friends as alternate shoppers.

The goal of these regulations would be to ensure access to benefits which is as comparable to the coupon system as possible, given the differences in technologies.

Allow Recipients to use Benefits to Obtain Food

At a minimum, FNS might stipulate that existing regulations governing acceptable uses for food stamp coupons apply to EBT benefits as well. Additional regulations could be introduced to ensure that an EBT system satisfies basic Food Stamp Program requirements. Regulatory guidelines would ensure that States adopt procedures which:

- allow recipients to carry forward positive balances from previous months;
- adjust food stamp balances whenever accounts are under/over-credited, or unauthorized debits are accidently posted;
- ensure access to benefits when electronic processing is not available, through the use of manually authorized transactions;
- establish liability resulting from overdrafts or limit the dollar amount of manual transactions when electronic processing is not available;
- provide recipients with adequate information about the amount of food stamp benefits available to them; and

- set policy for benefits that remain in the accounts of inactive clients.

Additional issues open to regulatory clarification include the following:

- Under what circumstances will recipients be permitted to convert electronic benefits to coupons (e.g., recipients move or shop outside of the area served by the electronic system)?
- How will fractional balances (i.e., cents) and balances under $2 be handled when electronic benefits are converted to coupons?
- What is the State's responsibility for training and equipping retailers with POS terminals?
- How many of a store's checkout locations will have to be equipped for electronic food stamp transactions?

With respect to the issue of where terminals need to be deployed, current regulations state that, "No retail food store may single out coupon users for special treatment in any way" (Regulation 7 CFR Section 278.2(b)(1988)). Retailers favor terminal deployment in all lanes; however, the cost of equipping every checkout counter with a POS terminal may be prohibitive. FNS could write regulations to accommodate retail concerns and provide EBT sites with guidelines for terminal deployment.

Crediting Retailers for Benefits they Accept

Under the coupon system, uniform procedures are used nationwide for crediting vendors. In the Multiple and Standardized Design approaches to system development, however, it is possible that EBT crediting procedures could vary from one system to the next. Beyond the basic requirement that retailers be accurately credited for electronic food stamp transactions, FNS might set standards for the timeliness with which retailers are credited for electronic transactions (e.g., two bank business days). FNS might also specify information that retailers are entitled to receive under an EBT system (e.g., records of individual transactions and deposits).

Ensuring Fiscal Accountability

State and Federal agencies are currently required to report and reconcile all phases of the coupon system. Although the specific points of EBT reconciliation differ from those of the coupon system, electronic benefit systems will have to ensure the legitimacy and accuracy of food stamp transactions and resulting account balances. Specifically, an EBT system will have to adopt procedures which enables it to:

- verify that benefit allotments credited to recipient accounts correspond to the benefit allotments authorized by the State. This requirement corresponds to existing coupon system reconciliation and reporting requirements (i.e., FNS Form 46 and FNS Form 250);
- perform system balancing to reconcile benefits issued with benefits redeemed and benefits remaining in recipients' accounts (because coupons redeemed cannot be reconciled against coupons issued, no comparable procedure exists in the coupon system);
- summarize credit and refund transactions to determine the net value of credits due each retailer;
- transfer funds to retailers to cover the amount of food stamp transactions and reconcile total transfers to banks against total transfers from USDA; and
- create and maintain records that permit an external auditor to verify the legitimacy of transactions and account balances.

The revised regulations should also address appropriate procedures for settling disputes over reconciliation discrepancies. Definitions of which party is liable for unresolved discrepancies leading to benefit loss also need to be included.

Provide Management Information

A primary requirement of the coupon system is that State and local agencies be capable of monitoring and managing program operations. Because similar requirements are inherent to EBT, it is necessary only for FNS to stipulate that all issuance and redemption systems generate timely and adequate information. States and other users of program data could determine an acceptable level of detail (e.g., food stamp personnel might want data

disaggregated by store, store type, recipient group, etc.). Alternatively, FNS could specify the required level of detailed management information.

DESIGN REQUIREMENTS

In addition to specifying the basic functions that EBT systems must perform, FNS could designate or restrict specific design features. Such parameters could be used to deter States from adopting costly, unreliable or untested EBT system features. Standardized guidelines also might be used to facilitate compatability and interchange among several (or all) EBT systems, or minimize the risk of fraud or negligence. Any attempt by FNS to achieve cost-effectiveness and compatability among EBT systems will likely require that some form of design requirements be imposed on State systems. Three such examples are discussed here.

The fundamental design issue that will have to be settled is whether EBT systems should utilize on-line or off-line technologies and the associated choice of access cards. On-line systems facilitate compatability with most existing commercial POS systems. Under some circumstances the off-line approach can be cost-effective. Until the presently proposed off-line EBT demonstration is evaluated, however, the possible cost-effectiveness and technical feasibility of an off-line system has not been observed. Thus, FNS would probably not want to take a stand on this design issue until the demonstration is completed.

Design features also affect the security of an EBT system. Under the coupon system, States are required to incorporate specific security precautions to minimize the risk of theft, fraud or negligence, and FNS holds States liable for a portion of resulting losses. FNS is likely to impose similar requirements on EBT systems. A report on EBT performance standards recommends that EBT systems should be required to:[1]

- conduct a vulnerability assessment of the proposed system design, and continually review system security procedures;

[1] John A. Kirlin and William L. Hamilton, Performance Issues in an Electronic Benefit Transfer System for the Food Stamp Program, Cambridge, Massachusetts: Abt Associates, Inc., forthcoming.

- utilize data encryption and message authentication to protect data transmissions;
- require recipients to use personnel identification numbers (PINs);
- design a complete and timely reconciliation system; and
- construct a complete audit trail.

Additional system security standards that may be imposed as a result of the Computer Security Act of 1987 are discussed later in this chapter.

A third system design capability that FNS might want to impose upon States utilizing EBT is interchange among neighboring, regional or all electronic issuance systems. As discussed in Chapter 2, interchange enables food stamp participants in one EBT system to access their benefits in another EBT system. This capability would be contingent, however, on standardization of several design features. Thus, if FNS wishes to facilitate interchange, it will have to impose the following design requirements on State-developed systems:

- access cards in each system must contain similar account and recipient identifiers, and the information will have to be formatted consistently;
- EBT databases maintained by each system must be capable of receiving and transmitting messages to a common switching facility;
- information and format of electronic issuance messages, including data encryption procedures, must be consistent;
- each EBT system must utilize standardized procedures for settlement of funds and reconciliation of transactions; and
- jurisdictions must agree upon common procedures for resolving errors, assigning liability, and arbitrating disputes.

PERFORMANCE STANDARDS

FNS could also establish performance requirements that specify "how well" EBT functions are to be performed. While diversity in system design might preclude the imposition of uniform standards, FNS might require States to establish their own performance criteria to ensure that their EBT system

performs in a timely and efficient manner. For example, FNS might require States to:

- establish acceptable standards for system availability;
- establish acceptable response time standards for all functions, but especially for EBT purchase transactions;
- ensure that system capacity is sufficient for the required level of system use;
- ensure that a high percentage (e.g., 99.9 percent or greater) of all EBT transactions are processed accurately; and,
- specify management information needs prior to system design, and test all reporting software and automated procedures prior to system implementation.

DELEGATION OF EBT-RELATED RESPONSIBILITIES

Existing regulations allow State Food Stamp Agencies to delegate responsibility for specific food stamp functions to county governments or private entities. For example, States often contract with banks to issue coupons, or with private firms to develop automated data processing systems. The regulations also contain restrictions on delegation of food stamp functions. For instance, retail food stores authorized to redeem coupons generally cannot act as issuance agents for the State.

For an EBT system, the regulations could continue to allow States to contract with private firms for the development and operation of automated data processing systems. Some restrictions would be needed to prevent conflicts of interest. Examples include prohibiting stores authorized to redeem benefits from operating the system or from deploying terminals in competing stores. The regulations could also address recipient privacy issues by specifying what system information can be accessed by private firms and for what purposes that information can be used.

The implementation of electronic benefit systems also raises the issue of who is liable for losses incurred in an EBT system. Existing regulations hold States liable for some coupon losses (i.e., coupons missing from inventory and certain types of improper issuances). In addition, States can hold private entities liable for any losses attributable to their operations.

Similar regulations could be adopted for losses in an EBT system attributable to a system vendor's improper operation of the system or overdrafts occurring when the system is unavailable for electronic processing.

TERMINAL COST SHARING

Two situations exist in which the costs of deploying and maintaining terminals in an EBT system could be shared between private firms and Federal or State Agencies. If an EBT system uses already-deployed commercial POS terminals, the owners of those terminals may reasonably expect reimbursement from State Agencies or, in the case of a Unitary EBT system, Federal Agencies. If, on the other hand, EBT terminals deployed by Federal or State Agency contractors are configured to accept commercial POS transactions, it is equally reasonable to expect that commercial POS networks or retailers pay for commercial use of the terminals. Disagreements over proposals for such payments already have risen in the State-initiated EBT demonstrations, and FNS might wish to provide guidelines in program regulations for when cost sharing is appropriate.

In preparing regulatory guidelines, the fundamental point could be that cost sharing is appropriate or necessary when public and private interests are supported by a single piece of equipment, regardless of who deploys and owns that equipment. The regulations could state that terminal amortization and maintenance costs should be shared on the basis of relative usage to ensure that neither public nor private groups are subsidizing the others' access to the terminal. The specific methods of reimbursement (e.g., per-transaction fees, monthly fees, an up-front connect fee, or some combination of the above) could be decided through negotiations with the terminal deployer.

6.2 REGULATORY ISSUES UNDER EACH ALTERNATIVE DEVELOPMENT APPROACH

MULTIPLE DESIGN APPROACH

Under the Multiple Design approach to system development, States design, develop, install and operate their own EBT systems. Although FNS establishes functional (and possibly performance) requirements, individual States (and their vendor(s)) have substantial flexibility in deciding how these functions are performed.

Functional Requirements

Under the Multiple Design approach, EBT is viewed as a "black box" which must perform a series of established functions. Thus, regulations would not be concerned with how functions are performed, but with the end result (e.g., the system must provide timely deposit information to retailers). Regulatory language under this approach is used only to define functions which an EBT system must perform.

FNS' experience with the State-initiated EBT demonstrations provides a basis for drafting the required functional requirements. In both the Federal Register Notice announcing the demonstrations[1] and the Cooperative Agreements with the State and County Agencies, FNS detailed the functional requirements for an on-line EBT system. The notice and agreements, however, gave States a good deal of latitude in deciding how to design and operate such systems. The notice also outlined special program requirements aimed at maintaining the "level and quality of service...that is mandated by law and program regulations." For example, these special requirements stipulate that EBT demonstration sites must be able to:

- maintain recipient access to retail outlets;
- insure equal treatment for food stamp customers (e.g., retailers may not establish exclusive lines for food stamp recipients);
- enable recipients to obtain information on remaining food stamp balances without making a purchase;
- allow households leaving or entering an EBT project area to use remaining benefits allotments; and
- validate that only authorized stores access the system.

Performance Requirements

Under any approach which permits States to design or operate an EBT system, FNS may want to implement performance criteria to ensure that system

[1] Federal Register, "Food Stamp Program; Demonstration Projects Using Electronic Benefit Transfer Technology." p. 35287, September 18, 1989.

participants are not adversely affected by system implementation. Thus, FNS would not only list functions, but publish corresponding performance standards. For example, instead of simply requiring EBT systems to provide retailers with timely deposit information, FNS might mandate that such information be provided within two working days.

FNS has not published performance criteria for most of the EBT demonstrations. The Agency, however, has stated that States wishing to develop on-line EBT systems must establish performance standards in six general areas before receiving authorization to proceed:[1]

- system processing speeds (response times),
- system reliability,
- system capacity,
- system security
- system ease of use, and
- system management information.

Program regulations could continue this approach or they could establish specific standards. The former approach may be preferred, inasmuch as future technological improvements could render specific standards obsolete.

Delegation of Authority

FNS will also have to establish liability under the Multiple Design approach. Because the systems will be developed by States, it is likely that they would be held liable for certain losses. This principle is similar to existing liabilities under the coupon system. Individual State Agencies, in turn, would be responsible for negotiating the liability of system developers and operators, specifying under what conditions the State Agency or the vendor would be liable for losses. It would probably be helpful to the States, however, if FNS published guidelines defining an appropriate locus of responsibilities, based on information learned during the EBT demonstrations.

[1]"Food Stamp Program On-line EBT Issuance Demonstration Projects," Food and Nutrition Service, U.S. Department of Agriculture, pp. 8-9.

STANDARDIZED DESIGN APPROACH

As discussed in Chapter 2, the Standardized Design approach to EBT system development differs from the Multiple Design approach in that FNS would specify design requirements or otherwise restrict EBT design options. Regulations for functional requirements and performance standards would be similar to those imposed under the Multiple Design approach.

Design Requirements

FNS might impose design restrictions on State EBT systems to facilitate compatibility with commercial POS networks or to promote the technical feasibility of transaction interchange between independent EBT systems. Other reasons for specifying design standards include reducing system design and development costs and system operating costs.

Program regulations covering system design issues could range from general to specific. An example of a general design issue is the choice of on-line versus off-line technologies. Program regulations could specify the use of one or the other technologies if the evaluations of the on-line and off-line EBT demonstrations show that one approach is clearly superior to the other in terms of administrative costs or impacts on participants.

More specific regulations would be needed to facilitate interchange and compatibility with commercial networks. Chapter 4 addressed the areas in which design standardization is needed to achieve interchange. To ensure compatibility and interchange availability, program regulations would need to cover these areas of standardization. In most cases adherence to the ABA guidelines for on-line, debit card operations would be sufficient, although additional specification would be needed to ensure the availability of interchange for manually authorized transactions.

Delegation of Authority

Program regulations governing the delegation of authority in a Standardized Design EBT system could be similar to those needed for a Multiple Design approach to system development. Although acceptable design options would be identified by FNS, it would still be the States' responsibility to develop and implement an EBT system. In addition, FNS would likely stipulate

that State Agencies be held liable for certain losses that might result from system operations.

UNITARY DESIGN APPROACH

Under the Unitary Design approach, FNS selects a single design option that must be used by all EBT sites within a given area. Regulations would therefore stipulate the functions, performance levels and design requirements for electronic benefit systems. States would then elect to utilize electronic issuance, or continue under the coupon system.

Because FNS (and its vendors) will be responsible for designing and operating the system, the regulations could conceivably contain less detail with regards to what the system must accomplish. That is, while the regulations would need to authorize the implementation of a nationwide EBT system with national or regional processing centers, details of how the system would operate could be left to FNS' discretion during the procurement process.

Nevertheless, the Unitary Design approach would require regulatory language that sets forth the responsibilities of State and local food stamp agencies. For example, FNS might establish regulations requiring participating States to provide issuance and program management data in a standardized format. In addition, FNS would need to delineate State or local office operational responsibilities (e.g., sending issuance authorization files to the national or regional vendor, issuing EBT cards and training recipients in how to use the system, updating recipient information on the system's database, and resolving recipient problems).

6.3 OTHER REGULATORY ISSUES FOR AN EBT SYSTEM

In addition to the regulations which govern the Food Stamp Program, system developers will have to consider other Federal and State laws which might further define or restrict an acceptable EBT system. State Agencies' program Operating Guidelines will need to be updated and followed as well. The remainder of this chapter addresses the applicability and potential impact of the following statutes and guidelines on electronic benefit systems:

- Privacy Act of 1974,
- Computer Security Act of 1987,
- Regulation E,
- State Laws, and
- State Operating Guidelines.

PRIVACY ACT OF 1974

The Privacy Act of 1974, as amended, governs record maintenance procedures for both Federal Agencies and entities operating under Federal contract. The Act stipulates that:

- disclosures of records under an agency's control are restricted to agency employees, law enforcement officials and other State and Federal Agencies--exceptions can be made if written consent is provided by the individual;
- agencies must maintan an account of the date, nature and purpose of any disclosures;
- agencies must honor the request of individuals seeking to review their records;
- only information that is relevant to the agency's purpose may be maintained;
- data should, whenever possible, be obtained directly from the individual;
- agencies must annually publish in the Federal Register a notice of the "existence and character" of each system of records it maintains; and,
- appropriate safeguards must be developed to insure the security and confidentiality of records.

The provisions of the Privacy Act directly apply to any EBT system developed for the Food Stamp Program. FNS could include in the EBT regulations a series of statements identifying sensitive client information (e.g., remaining food stamp balance, issuance amount, program participation identifiers). In addition, it might stipulate that data collected for one purpose cannot be used for another without permission, except for routine uses. Because food stamp agencies currently operate under these principles, it will not require explicit regulatory language to impose these standards on EBT systems. Under the Unitary Design approach, FNS can simply extend existing regulations to electronic benefit systems. Under the Multiple and Standardized Design approaches, food stamp regulations would have to mandate compliance with Privacy Act provisions. For example, FNS might require that States submit a plan for ensuring protection of sensitive recipient data. This requirement would also apply to private vendors responsible for design and operation of EBT systems.

COMPUTER SECURITY ACT OF 1987

The Computer Security Act of 1987 protects the integrity and security of sensitive data contained within Federal computer systems. Specifically, the Act mandates that Federal Agencies:

- identify existing or planned Federal computer systems that contain sensitive data;[1]
- train managers and users of Federal computer systems (including private sector users wherever applicable) that contain sensitive information; and,
- develop standards and guidelines that control loss, unauthorized modifications and disclosure of sensitive information contained in Federal computer systems.

The Act also requires Federal Agencies to submit a plan for ensuring the security and privacy of each Federal computer system that contains sensitive data. This provision extends to private contractors that process secure Federal information.

Any EBT system developed by Federal Agencies under the Unitary Design approach will be required to comply with the Computer Security Act. Such compliance is not required under the Multiple and Standardized Design approaches, because these EBT systems would be operated under State authority.

In response to the Act, however, FNS has introduced regulations which specify security procedures which would apply to EBT systems developed under the Multiple or Standardized Design approaches. These regulations establish "minimum standard requirements for the security of non-Federal ADP systems used by State and local governments in the administration of the Food Stamp Program."[2] The regulations require State Agencies to:

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[1]Sensitive data means "any information, the loss, misuse or unauthorized access to or modification of which could adversely affect...the privacy to which individuals are entitled under Section 552a of title 5, U.S. Code (the Privacy Act)."

[2]Federal Register, Food Stamp Program; Automated Data Processing Equipment and Services; Conditions for Federal Participation, Food and Nutrition Service, USDA, August 8, 1988.

- use Federal ADP and/or private industry standards to develop performance criteria which safeguard computer resources and information processing activities;

- establish an ADP security program to implement plans, policies and procedures to satisfy these performance criteria;

- conduct periodic risk analyses to evaluate and rectify potential security threats; and

- submit biennial ADP system review reports to FNS.

Under these regulations, States designing and operating an EBT system (i.e., Multiple and Standardized Design approaches) are not required to submit security standards and procedures to FNS for approval. Hence, it is the responsibility of each State to ensure the adequacy of its security measures. However, States do need to submit a biennial EBT system review report which identifies and monitors corrective action procedures.

REGULATION E

The rights and liabilities of institutions and consumers who utilize electronic funds transfer systems are set forth in the Code of Federal Regulations, Title 12 (Banks and Banking), Chapter II (Federal Reserve System), Part 205 (Electronic Funds Transfer), commonly known as Regulation E. This Federal regulation mandates that financial institutions must:

- Issue electronic funds transfer (EFT) cards only to consumers who request them--unsolicited cards may not be offered.

- Provide written information which details consumer rights, responsibilities and liabilities under EFT. Consumers must receive written notification of any modifications to these conditions.

- Provide consumers with written, monthly statements summarizing account activity. Receipts must also be provided at the time of each EFT transaction.

- Provide written notice to any consumer whose account is credited via EFT by the same payor at least once every 60 days (e.g., direct deposit of paychecks).

- Investigate and respond to errors that occur under an EFT system within 10 business days (or 45 days, so long as the consumer has access to the disputed funds in the interim).

In cases of loss or theft, consumers may be held liable for unauthorized transfer of funds, although liability is generally limited to a set amount (e.g., $50). Consumers may be held liable for higher amounts if they fail to notify the financial institution within two business days after learning of loss or theft of the card.

Because food stamp benefits are not money and food stamp agencies are not financial institutions, the applicability of Regulation E to EBT is unclear. The USDA Office of the General Counsel ruled that Regulation E did not apply to the Reading demonstration. Furthermore, a recent Federal Reserve decision maintains that Regulation E pertains only to consumer asset electronic funds transfers--transfers that move consumer funds from one account to

benefits.[1] The current New Mexico EBT demonstration project, however, offers two examples of the types of State-level regulatory issues that might be encountered in sites that elect to implement EBT systems.

During the system design phase, New Mexico food stamp staff determined that provisions of the State's Remote Financial Service Unit Act, which regulates credit card and account access device transactions, might also be applied to POS food stamp transactions. The Act does not specifically prohibit electronic issuance of food stamp benefits. Nonetheless, State staff were concerned that each POS terminal might legally be construed as being a branch bank and, therefore, subject to existing banking requirements. To circumvent this, regulatory language was adopted excluding electronic food stamp transactions from the Remote Financial Service Unit Act. This langauge ensures that existing requirements on financial institutions will not be imposed upon electronic government benefit transactions.

New Mexico food stamp staff also are examining a State banking regulation which prohibits financial institutions from operating a branch in more than a single county. Because the deployment and maintenance of New Mexico's POS terminals are the responsibility of a financial institution (i.e., First National Bank of Albuquerque), there is concern that this principle would hinder (but not prohibit) expansion of electronic funds transfer beyond the demonstration county. Alternatively, the First National Bank of Albuquerque could contract with a correspondent bank in each external county that elects to utilize EBT. Under such an arrangement, the First National Bank of Albuquerque would continue to install and operate POS terminals in all jurisdictions. However, it would transfer ownership of each POS device to a correspondent bank within each external county. Retailer deposits in external counties would similarly be transferred through correspondence banks. Until such arrangements are developed, food stamp recipients will not be permitted to use their electronic benefits in adjacent counties. New Mexico food stamp staff are in the process of determining whether additional legislation to exclude electronic food stamp transactions from this regulatory banking restriction will facilitate future efforts to expand EBT beyond the demonstration county.

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[1] Details of the survey are described in Chapter 7.

Each of these examples is unique to New Mexico. Many States permit banks to operate Statewide, and New Mexico is the only demonstration site that is using a financial institution as its primary vendor. Nonetheless, it can be assumed that, as they investigate EBT, other States may be required to address similar legal impediments.

STATE OPERATING GUIDELINES

Program regulations require that State Food Stamp Agencies prepare Operating Guidelines that detail planned operating procedures for all program functions. Training procedures and materials also have to be prepared. The guidelines must be approved by FNS.

The implementation of an EBT system will require that a State's operating guidelines be updated to reflect the new procedures needed to operate the EBT system. New procedures will be needed for card issuance, recipient training, and administrative functions involving access to the system's database (e.g., checking account balances or transaction histories, establishing new accounts, and placing holds on accounts when cards are reported as lost or stolen). Other functions that would be covered by the guidelines include: creating issuance authorization files, converting EBT benefits to coupons, and receiving and using system data to generate program reports.

In the Multiple or Standardized Design approaches, State Agencies become involved in benefit redemption activities for the first time. If either of these two approaches to system development is selected, therefore, new procedures need to be written for terminal deployment and management, retailer training, and crediting of retailer accounts during system settlement, as well as other related tasks.

Once written and approved, the revised Operating Guidelines form the basis for all EBT system operating procedures, and State, local and vendor personnel must follow the specified procedures. After an EBT system is implemented, any desired changes in operating procedures must be reflected in the program operating guidelines.

6.4 SUMMARY

Changes are needed to both authorizing legislative and program regulations before a nationwide EBT system can be implemented. On the legislative side, the Food Stamp Act of 1977 needs to be amended to allow benefits to take the form of alectronically stored data as well as paper coupons. Program regulations need to be revised to allow EBT systems to serve as alternative benefit issuance and redemption systems.

In addition to specifying EBT systems as an alternative issuance and redemption mechanism, program regulations could provide guidelines on the functional requirements of such systems and their performance characteristics. If FNS wanted to ensure that State EBT systems would be compatible with commercial POS systems or that interchange between systems was possible, the regulations also would need to specify some standards for system design. Finally, the regulations would need to address issues of State delegation of EBT responsibilities to vendors, including the locus of liability for various forms of benefit loss.

With respect to other Federal legislation, any EBT system will have to comply with provisions of the U.S. Privacy Act of 1974. Although EBT system operations will require access to information about program recipients, the systems typically do not require information that would identify specific individuals. Thus, compliance with the Act should not be a problem.

The U.S. Computer Security Act of 1987 will pertain to an EBT system developed under the Unitary Design approach. The Act is not applicable, however, to EBT systems developed by State Agencies or their vendors. Instead, these systems will need to meet recently promulgated program regulations governing the secure operation of non-Federal ADP systems used in the administration of the Food Stamp Program.

While the Federal Reserve Board's Regulation E does not appear to apply to EBT systems, interpretation of the regulation is still in progress. The possibility that implementation of EBT systems will face problems with State laws or regulations also exists, but no major problems have been identified at this time.

Finally, before an EBT system is implemented, States need to update their program Operating Guidelines to reflect the new benefit issuance and redemption procedures they and their vendors will follow when operating the system. The guidelines will need to be revised as changes in operating procedures are adopted.

Chapter Seven

STATE INTEREST IN EBT SYSTEMS

A key factor in the implementation of a nationwide EBT system is whether individual State Agencies are interested in EBT systems. Even if FNS and other Federal Agencies provide a regulatory and administrative environment that supports these systems, final implementation decisions will rest with State officials. This chapter examines the level of State interest in EBT systems, identifying those States in which near-term implementation is most likely.

In conjunction with State interest, it is expected that near-term implementation of EBT systems may be more likely in those States with existing commercial POS activity. An existing commercial POS infrastructure could ease EBT implementation by reducing terminal deployment costs and encouraging retailer participation in an integrated POS and EBT system. Accordingly, the first section of the chapter describes the current status of commercial POS activity by State, and the potential for growth of commercial POS networks. Section 7.2 discusses the findings of interviews conducted with State officials about EBT systems. The advantages and disadvantages of EBT systems, as described by State Agency officials, are discussed. Section 7.3 identifies States with active interest in EBT systems, and assesses the correlation between State interest in EBT systems and commercial POS development. Section 7.4 discusses EBT system design characteristics envisioned by State Agency officials, and their views on a national EBT system. Section 7.5 provides a chapter summary.

7.1 THE CURRENT STATUS OF COMMERCIAL POS DEVELOPMENT

In a nationwide EBT system, POS terminals will be needed in a large number of retail food stores across the country. The existence of commercial POS networks raises the possibility of linking (or "piggy-backing") EBT systems with commercial networks. Integration with a commercial network offers several advantages to an EBT system, primarily cost savings from shared POS terminals, and may make recruitment of food retailers for the EBT system easier. In this section we examine the current status of the market for commercial POS, the potential for expansion of commercial networks, and the implications of commercial POS development for EBT systems.

Currently in a number of cities, consumers can use a retailer's proprietary debit card or a bank (ATM) debit card to pay at the point-of-sale for purchases in grocery stores, convenience stores, gas stations, fast food restaurants and other retail establishments. The transaction may be debited immediately from the customer's bank account (on-line POS), or it may be cleared off-line through the Federal Reserve's Automated Clearing House network (ACH-POS). In an ACH-POS system, each POS transaction is checked against a file that typically indicates purchase amount limits or a limit on the number of purchases in a day, instead of checking against the customer's actual balance. Currently, about 80 percent of POS debit transactions are on-line, while the remainder are ACH-POS.

While the growth in the number of commercial POS debit terminals has been steady over the past five years, the total number of debit terminals deployed is still fairly small. A total of about 51,000 debit terminals were deployed in gas stations and in retail food, convenience and specialty stores by December 1989.[1] About 20,000 of these terminals were located in retail food and convenience stores. Consumer acceptance of POS debit as a payment means does appear to be increasing, however, as evidenced by a 30-percent increase in the number of POS debit transactions in 1989. Average monthly debit transaction volumes increased from 8.4 million in 1988 to 11.0 million transactions in 1989.[2]

While the number of debit terminals and the volume of POS transactions have been growing, commercial POS networks are still concentrated in only a small number of States, primarily California, Florida, Arizona, Iowa, and Texas. Even in these States, however, network coverage is not statewide, but tends to be in urban areas. In addition, some of the large commercial POS networks have terminals primarily in gas stations or specialty stores. While

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[1]Data on the number of debit terminals are based on the "Semi-Annual Survey of Debit Terminals," POS News, vol. 6 no. 7, January 1990. Another source estimates a higher number of debit terminals, about 70,000, as of early 1989. ("POS Monitor," EFT Today, March 1989.) This figure may include debit-capable terminals that are not currently used for debit transactions, e.g., no debit cards have been issued. We use the number presented in the text to represent the active debit market.

[2]POS News, vol. 6, no. 7, January 1990. A breakdown of the number of transactions by type of merchant was not provided.

expansion of some of these networks to retail food stores is possible, the potential for near-term linkage with a Food Stamp EBT system seems more likely with networks that deploy terminals in retail food stores.

The retail food stores in which commercial debit terminals are currently deployed tend to be large supermarket chains. For example, Lucky and Alpha Beta Supermarkets in California and Publix Supermarkets in Florida have deployed debit terminals linked to commercial POS networks in many of their stores. Other supermarket chains have started their own ACH-POS systems, including Von's Grocery of California and Amarraca Supermarkets in Pennsylvania. Competitors' behavior appears to be an important influence on the decision by a retail food chain to deploy POS terminals. Deployment of terminals has been spreading among supermarket chains in California and Florida, for example. Another example is the St. Louis, Missouri area. While commercial debit networks are not well-established in this area, several large chains, including National Food Stores, Dierbergs and Schnucks, were conducting or considering pilot debit projects in 1989.

In Exhibit 7-1, the 50 States are classified into three categories of commercial POS development in food retailing.[1] States classified as having "maturing" commercial POS networks had over 400 debit terminals deployed in supermarkets and convenience stores by mid-1989. States with "emerging" commercial POS networks had between 10 and 300 debit terminals deployed in food retailing at that time. In most of the States characterized as having maturing or emerging commercial networks in food retailing, an additional 50 or more debit terminals were deployed in gas stations and specialty stores.

Eight States are classified as having maturing commercial POS networks. Most of these States have debit terminals deployed by more than one commercial POS network. Most of the commercial networks have terminals deployed in other types of stores as well as supermarkets and convenience stores.

[1]The number of terminals in a State is based on data on the number of terminals for each commercial POS network. Because some networks have terminals in more than one State, the breakdown of the number of terminals by State is approximate.

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Exhibit 7-1

EXTENT OF COMMERCIAL POS DEBIT IN FOOD RETAILING

States with "maturing" commercial POS networks in food retailing:

Arizona
California
Florida
Iowa
New York
Ohio
Oregon
Texas

States with "emerging" commercial POS networks in food retailing:

Alaska
Georgia
Indiana
Maine
Minnesota
Missouri
Pennsylvania
Nevada
Tennessee
Washington
Wisconsin

Note: States classified as having "maturing" commercial POS networks had over 400 debit terminals deployed in supermarkets and convenience stores by mid-1989. States with "emerging" commercial networks had between 10 and 300 debit terminals deployed in supermarkets and convenience stores.

Source: Based on network data from POS News, June 1989. Terminal data are presented only by network, so the breakdown of the number of terminals by State is approximate.

States classified as having emerging commercial POS networks are characterized by commercial POS terminals deployed in food stores on a smaller scale. As shown in Exhibit 7-1, eleven States are classified as having emerging commercial POS networks. Several of these States, for example Georgia, Pennsylvania, and Tennessee, have 200 or fewer commercial terminals in food and convenience stores and, yet, each has a fairly extensive POS network in other types of stores. Expansion of commercial POS into food retailing is possible in these States in the near term.

The remaining States have little or no commercial POS activity in food retailing. In a number of these States, however, there are POS terminals deployed in gas stations or other non-food stores. In addition, in several of these States, including Maryland and Nebraska, small-scale pilot projects using debit cards have been conducted in food retail stores. Nonetheless, widespread deployment of commercial debit terminals in food retailing is probably less likely in these States in the near term than in those with existing commercial POS networks.

Commercial POS networks are expected to continue to increase the number of terminals deployed in food retail and other types of stores. One estimate projects that 73,000 debit terminals will be deployed by the end of 1990--a 43-percent increase over 1989. However, projections of the number of terminals to be deployed should be viewed with caution. Past projections of the number of terminals to be deployed in the commercial POS industry have consistently overestimated the pace of growth. For example, from 1984 to 1985, the number of debit terminals increased by nearly ten-fold, yet the number of terminals in 1985 was still only about two-fifths of the projected level.

Exhibit 7-2 presents projected and actual numbers of commercial POS debit terminals in recent years. In each year shown except 1989, expectations have exceeded the actual number of terminals deployed by at least 35 percent. In addition, overestimation of the projected number of terminals has been typical of most of the commercial networks, indicating that unmet expectations have occurred across the industry. Nonetheless, Exhibit 7-2 also shows that while actual terminal deployments have been increasing steadily, expectations of growth have been scaled back recently compared with expectations in 1987.

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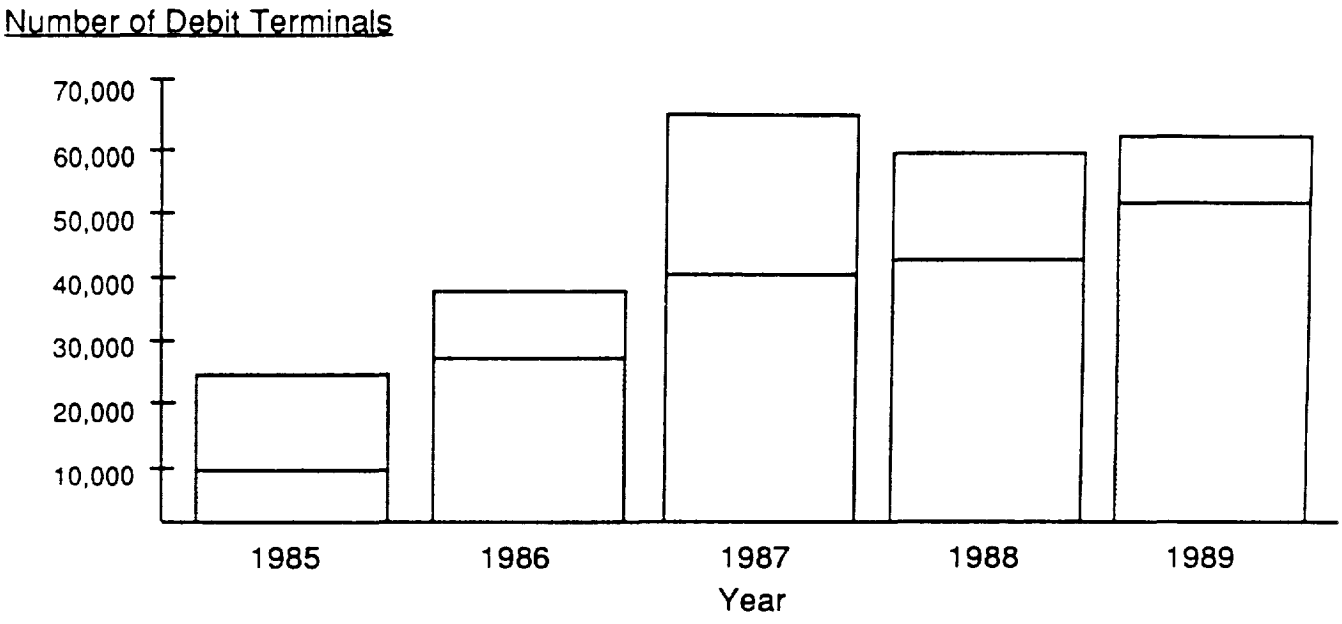
Exhibit 7-2

PROJECTED AND ACTUAL NUMBER OF COMMERCIAL POS TERMINALS



End of Year	Number of Debit Terminals Projected	Actual
1985	25,000	10,000
1986	37,000	27,421
1987	64,680	41,116
1988	59,469	44,028
1989	62,802	51,054

☐ = actual number of terminals

☐ = projected number of terminals (projection made in December of the previous year)

Source: POS News, various years.

The discrepancy between actual and expected growth in the commercial POS sector has been blamed on a number of factors. Initial growth (four or five years ago) may have been slowed by high terminal costs, a lack of standards, technical problems with hardware and software, and uncertainty over Federal regulations. Some of these difficulties have been eliminated or reduced in recent years. For example, terminal costs have decreased, and standards of banking and other groups now generally include EFT and POS. Many of the issues over Federal regulations (such as Regulation E) have also been settled.

Nonetheless, commercial POS growth still continues at a pace that is slower than expected. Pricing disputes--who should pay for terminal and transaction costs--are often cited as a major factor impeding the growth of commercial POS networks.[1] The problem arises in part from the involvement of three different groups--bankers, retailers, and consumers--with different perceptions of the costs and benefits of POS. Merchants have generally been reluctant to deploy POS terminals because of the high initial investment, uncertainty over bank fees, and a perceived lack of consumer demand. Most banks also have not been pushing POS, perhaps because of the lack of a clear marketing and pricing strategy. Consumers do not appear to be demanding debit cards, perhaps due to lack of information and little incentive to switch from current payment mechanisms.

Despite these problems, growth of commercial POS networks is likely to continue at a steady (if unexplosive) rate. Evidence from pilot projects and from successful networks in a few States suggests that consumers will use debit cards to replace a portion of check, cash, and credit transactions. The growth of consumer use of debit cards will depend, however, on the pricing of debit cards and POS transactions, and on the availability of POS terminals. Pricing continues to be an unresolved issue: POS debit fees currently are

[1]Some recent articles that discuss reasons for slower-than-expected growth in commercial POS debit include: Saul Hansell, "The debit-card dilemma," Institutional Investor, March 1989; Stephan P. White, "POS Direct Debit: Why Isn't the Revolution Underway?" American Banker, February 15, 1989; and "Banks and Retailers Split Over Flat Debit Fees," POS News, October 1988.

less than ATM fees, though some networks are beginning to increase POS fees while others continue to subsidize POS debit to encourage its use.[1]

In food retailing, the growth of commercial POS is also likely to be slow but steady. Food retailers generally operate with a small profit margin, so they will require that POS be proven cost-effective. In addition, food retailers are likely to prefer a system that has been shown to speed up checkout transactions and is easy for clerks to use. Based on past activity, the expansion of commercial POS in food retailing in the next few years is likely to occur mostly in the larger retail stores and chains.

The implementation of EBT systems is likely to aid the expansion of commercial POS networks. An EBT system would increase the visibility of POS and debit cards as a payment mechanism, and may provide the impetus to retailers to offer commercial POS in addition to the EBT system. On the other side, the presence of a commercial POS network is likely to make implementation of an EBT system easier and less costly, because of shared terminal costs and possibly greater retailer participation.

While the expansion of commercial POS networks may reduce costs and make implementation of EBT systems feasible, linking an EBT system with commercial POS networks presents several issues to be addressed. First, the terminals, cards and transaction messages must be compatible in order for an EBT system to link with a commercial network. Second, retailers and commercial networks may have different priorities than developers of EBT systems. For example, checkout speed and system reliability may be of top concern to retailers, while EBT system developers also need to consider the system's ease of use and vulnerability to fraud. Design differences, such as the use of on-line authorization versus batch processing, may also create potential incompatibilities.

As discussed in the next section, most States considering EBT systems envision a system linked with a commercial POS network. However, the potential for linking an EBT system with a well-established commercial POS network currently exists in only a few States. While growth of commercial POS networks will continue, it seems unlikely that widespread use of commercial

[1] Bank Network News, vol. 7, no. 18, February 9, 1989.

debit cards in food retailing will occur in more than a few States in the next two to three years. More likely, implementation of State EBT systems and expansion of commercial networks may occur simultaneously in some areas, and State implementation of EBT systems may encourage expansion of commercial POS networks elsewhere.

7.2 REASONS FOR STATE INTEREST IN EBT SYSTEMS

In order to learn more about the level of interest in EBT systems for the Food Stamp Program in different States, two rounds of interviews were conducted in the Spring of 1989. First, all seven Regional Food Stamp Program offices were contacted to find out which States in their regions had expressed interest in EBT systems. Based on these interviews, 25 States were selected for a second round of telephone interviews. The States were selected to include most of the States thought to be interested in EBT at that time. In addition, a few States not interested in EBT were contacted to provide some insight into their concerns about EBT.

The State Agency respondents in the second round of interviews were selected based on their knowledge and familiarity with EBT-related issues within the State. Their professional positions included State Food Stamp or Income Maintenance Directors or Administrators, State EBT project coordinators, and computer analysts assigned to EBT-related functions.

In addition to asking about general interest in EBT systems, the State Agency officials were questioned about a number of issues related to EBT system development and implementation. Interview topics included the feasibility of implementing an EBT system in the State and what steps, if any, were being taken towards the planning and implementation of an EBT system. Respondents were also asked their opinions about the benefits and possible problems of EBT systems and the obstacles to implementing EBT systems in their States.

PERCEIVED BENEFITS OF EBT SYSTEMS

Most of the State Agency officials expressed support for EBT systems in general, and provided a variety of explanations for their interest in EBT. Respondents generally believed that EBT systems would enhance the public image of the Food Stamp Program. Many respondents described EBT systems as

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redemption, and reconciliation. In addition, retailers would no longer have to provide cash change for food stamp purchases.

Most State Agency officials expressed a high degree of faith in EBT systems, observing that while EBT systems may prove to be less cost-efficient to operate in the short term, advances in EBT systems and related technologies would eventually reduce system operating costs to the point where EBT systems would be more cost-efficient to operate than current systems. Respondents frequently predicted that EBT systems would be "more straightforward to administer" and "far less complicated to operate" than ATP/coupon systems. EBT systems, these respondents observed, may prove to be superior to current systems due to their higher overall operating efficiency, their lower staffing and paperflow requirements, and their more centralized, less-complicated designs.

OBSTACLES TO STATE IMPLEMENTATION OF EBT SYSTEMS

While many of the State Agency officials were supportive of EBT systems in general, they identified a number of obstacles to implementation of EBT systems in the near term in their States. Resource constraints frequently were cited as the largest obstacle to implementation of EBT systems. Both lack of funding at the State and Federal levels, and lack of appropriate personnel (having the necessary technical or managerial skills) were viewed as the major obstacles to EBT system development. Officials cited lack of funding to cover both the high startup costs of EBT systems and the potentially high operating costs of EBT systems. Especially in States with relatively cost-efficient current issuance systems, respondents did not believe they could promote EBT system development until EBT systems are shown to be cost-effective.

Lack of interest within their agencies or from other agencies in the State was frequently reported as an obstacle to EBT system development. State Agencies may not be in the position to move towards EBT systems because of other priorities, including other demonstrations or computer enhancements. In addition, many State officials reported that while their agencies would consider multiprogram EBT systems, because other departments or agencies within the State are not currently interested in pursuing EBT systems, or because of problems involving poor coordination among administrative departments, they are unable to pursue EBT systems at present.

State Agency officials from predominantly rural States cited several obstacles to implementation of EBT systems due to the nature of their States. They frequently cited the high costs associated with installing POS terminals in remote rural areas as the most significant obstacle toward EBT system development and implementation. Higher implementation costs may result from the lack of adequate telecommunications networks and the large number of food retailers (including roadside vendors and other small-scale retailers) without existing telephone capability. In addition, the large number of small "mom and pop" retailers requiring POS terminals (or an alternative backup system) could increase implementation costs. Officials from States with large rural sectors frequently reported that a lack of client and retailer "technological sophistication" potentially represents a significant obstacle to the implementation of EBT systems. They anticipated such problems as the inability or unwillingness of retailers to change from the paper coupon system to the more technologically complex EBT system, and recipient difficulties in using POS and ATM terminals.

State officials also thought that local banks and local food retailers could present obstacles to EBT system implementation. Local banks were occasionally cited by respondents as opposing EBT system development because these banks might be at a competitive disadvantage with the EBT system vendor or with other local banks that could profit from the implementation of EBT systems. Officials also occasionally cited opposition to EBT systems from commercial interests, such as check-cashing agents, credit institutions, issuance agents, and other interests holding a stake in the current food stamp coupon system. Because such commercial interests may currently hold profitable contracts with food stamp agencies to deliver services under the present food stamp coupon system, these firms may oppose the movement toward alternative issuance systems for the Food Stamp Program. Similarily, State Agency officials thought that some food retailers might object to EBT system implementation. Potential retailer concerns cited include the possibility of shifts in shopping patterns due to EBT, training costs, system reliability, and whether retail outlets would receive sufficient numbers of POS terminals.

Officials also expressed concerns over potential negative effects of EBT systems on food stamp recipients. While most respondents indicated that they believed EBT systems would generally improve client services, many

expressed concern about certain potential problem areas. Officials were concerned about the quality and availability of recipient training, and that some recipients would have difficulty using EBT cards or terminals, or would have trouble keeping their PINs secure and avoiding loss or damage to their EBT cards. Officials also worry that, in an EBT system, recipients' shopping patterns would be restricted or changed, either because not enough stores participate or because of an insufficient number of POS terminals. Finally, many respondents noted that elderly, disabled, or non-English speaking recipients might have more difficulty using an EBT system than other households, and that the needs of these groups must be addressed. Potential opposition to EBT systems from client advocacy groups was also cited by some respondents as a possible obstacle to EBT system implementation.

Nearly every respondent identified potential problems relating to the reliability and security of EBT systems as among their most serious concerns with EBT systems. State Agency officials noted that technical training and quality of system operations and maintenance staff are important to system performance and integrity. Respondents frequently reported concern that the possibility of glitches or flaws in EBT systems could affect the accuracy of client benefit and case data, program reporting statistics, and other critical stores of program information. The need to prevent access by unauthorized individuals to system databases to prevent interference with, or exploitation of, client benefit information or other sensitive program data was emphasized frequently.

Respondents frequently reported concerns about management issues involving EBT systems. Many State officials observed that while EBT systems would probably serve to ultimately reduce the level of agency staff time required to carry out benefit issuance and other related functions, increased staff time would probably be required during the initial implementation phase for EBT systems. Many officials also indicated concerns regarding the managerial burden of maintaining large-scale vendor contracts, as many of the ongoing functions carried out under the current Food Stamp Program would be contracted out to an independent EBT vendor. Concern was also reported regarding potential policy-related and managerial problems with operating multiprogram EBT systems. Respondents frequently indicated that interagency coordination and management of EBT systems, at both the State and local

levels, could prove to be problematic. Such problems would arise from both a lack of existing interagency coordination, and from the existence of interagency bureaucratic competition. Several officials also indicated that multiprogram EBT systems would require difficult adjustments in the States' current accounting procedures.

SUMMARY

Even though the State Agency officials identified a number of obstacles and concerns about EBT, overall they were very positive about the concept of an EBT system. In fact, most seem interested in eventually implementing EBT systems in their States. The State officials believed that EBT would be very beneficial to recipients, food retailers, and banks, and would improve administration of the program. Increases in Federal and State funding, decreases in EBT operating and development costs, and growth of commercial POS networks would all increase the number of States willing and able to implement EBT systems.

7.3 CURRENT PROSPECTS FOR EBT DEPLOYMENT

As discussed in Section 7.1, the existence of a commercial network in a State creates the potential for linkage with an EBT system; however, this potential linkage alone is not sufficient to suggest that near-term implementation of an EBT system is likely in that State. Implementation of an EBT system in a particular State depends to a large degree on the willingness of the State Agency to take the initiative. Those States that are interested in EBT and have some commercial POS already in place could be viewed as having the most promising conditions for near-term implementation of EBT systems.

While most of the State Agency officials interviewed expressed interest in EBT systems, many are not currently planning EBT systems because of the obstacles and concerns discussed above. A number of States, however, are currently moving towards implementation of EBT systems. We define a State as having an "active interest" in EBT if, at a minimum, it has begun the process of submitting a waiver request for an EBT demonstration. Activities such as issuing a request-for-information or a request-for-proposals, setting up an EBT project team, or informing FNS of the State's intent to begin the EBT planning process are considered to be evidence that a State is actively interested in EBT.

As shown in Exhibit 7-3, 17 States currently appear to be actively interested in implementing EBT systems in the relatively near future. Within this group, however, there is a considerable range of progress towards implementing EBT systems. The group includes the States currently implementing EBT demonstrations as well as States that have submitted proposals for waiver requests to FNS. A few States in the group are less far along in the process, but they have expressed interest in EBT and appear to be moving ahead in the planning process. For example, a few States in this group have issued requests-for-information while others have notified FNS of their intent to begin planning to submit a waiver request for an EBT system.

It is important to note that the group of States that is interested in EBT is likely to continue to change over time. The list of active States may be incomplete, as other States may have become interested in EBT and may have begun the planning process since our interviews. Some of the States not currently actively interested in a Food Stamp EBT system are planning on-line issuance systems or EBT systems for other assistance programs. A few of the States excluded from the active list have investigated or even proposed EBT systems in the past, but they do not appear to be planning such systems currently. Some of these States could decide to pursue an EBT system if circumstances change.

On the other hand, some States in the actively interested group may lose interest in EBT, if, for example, there is a change in State administration or funding is inadequate. While the list of States that is actively interested in EBT will continue to change, this group provides a base from which to examine the States that appear to have promising conditions that support near-term implementation of EBT systems.

The States with conditions that support near-term deployment of an EBT system are identified in Exhibit 7-4, which shows the correlation between the existence of commercial POS networks and the States actively interested in EBT. States in which commercial POS networks are more widespread might be more likely to develop an EBT system in the near term, because of the possibility of cost savings and easier retailer recruitment and implementation. As the exhibit shows, however, there is not a close correspondence between the States that are actively interested in EBT and those with the most extensive commercial POS networks. Only three of the 17 actively interested States are

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Exhibit 7-3

STATES WITH ACTIVE INTEREST IN EBT

Region	States
NORTHEAST	Maine New Hampshire Vermont
MIDATLANTIC	Maryland New Jersey Pennsylvania
SOUTHEAST	Georgia Mississippi South Carolina
MIDWEST	Minnesota
SOUTHWEST	New Mexico Oklahoma Texas
MOUNTAIN PLAINS	Colorado Iowa
WESTERN	California Washington

Note: Identification of States with an "active interest" in EBT is based on interviews with State officials in the Spring of 1989.

Exhibit 7-4

CORRELATION BETWEEN COMMERCIAL POS ACTIVITY AND STATE INTEREST IN EBT

Extent of commercial POS in food retailing	States with active interest in EBT
"Maturing" networks	California Iowa Texas
"Emerging" networks	Georgia Maine Minnesota Pennsylvania Washington
Little or no commercial POS in food retailing	Colorado Maryland Mississippi New Hampshire New Mexico New Jersey Oklahoma South Carolina Vermont

characterized as having "maturing" commercial POS networks. Another five States that are actively interested in EBT systems have emerging commercial POS networks. In these States, the networks cover only some of the State's urban areas and had fewer than 300 debit terminals deployed (as of June 1989). More than half of the States that are actively interested in EBT had little or no commercial POS in food retailing in 1989.

Based on the exhibit, the current extent of commercial POS activity does not appear to be a major factor in determining the current level of interest in EBT within State Agencies. The role of commercial POS development in affecting the likelihood of State interest in EBT is less important than expected, in part, because commercial POS networks have not yet achieved widespread deployment of terminals in many areas. Nonetheless, most of the State Agency officials interviewed assumed that State EBT systems would be linked with commercial POS networks, regardless of the current extent of commercial POS networks in their States. Given the slower-than-expected growth in commercial POS networks, EBT system deployment may spur commercial POS growth, instead of commercial networks providing the impetus to EBT systems.

The level of interest in EBT systems in the State Agency is likely to be the most important determinant of the potential for EBT deployment in a State in the near term. The lack of commercial POS networks in nine of the States actively interested in EBT is not viewed by the States as a major obstacle to EBT implementation. They assume that commercial POS networks are expanding, or that EBT may spur commercial POS growth. In New Mexico, for example, the EBT demonstration vendor is marketing commercial POS debit to retailers who participate in the EBT system.

Other potential indicators of State "readiness" for EBT were considered in determining the States with promising conditions for near-term development of EBT. For example, information on State computer systems and the level of automation of the Food Stamp Program were investigated. Nearly all States, however, have the minimum data processing capabilities needed to create an automated file of food stamp participants and their benefit amounts. Thus, computer capability does not appear to be a major factor inhibiting near-term implementation of EBT systems. Factors such as high issuance costs or high levels of issuance losses in a State's current system

also might be important influences on a State's decision to consider EBT systems. No clear pattern emerges, however, when comparing State's interest in EBT with the level of issuance costs or losses in their current systems.[1] No strong regional pattern of interest in EBT is apparent either, though the Northeast, Mid-Atlantic, and Southeast Regions appear to have more States actively interested in EBT than the other Regions. Overall, factors such as a State's computer capability, issuance costs or loss rates, and regional factors do not appear to have much influence on the States' current level of interest in EBT systems or on States' readiness to implement EBT systems in the near term.

7.4 STATE AGENCY VIEWS ON A NATIONAL EBT SYSTEM

As part of the interviews conducted for the analysis of State interest in EBT systems, State Agency officials were asked about the main design features they would likely incorporate in EBT systems in their States, and about their views on a national EBT system. Most of the State Agency officials who were interviewed preferred EBT systems with fairly similar features. Respondents expressed interest in ultimately developing multi-program EBT systems, including (along with the Food Stamp Program) assistance programs such as AFDC, Medicaid, Child Support Enforcement, Unemployment Insurance, Federal Training Allowances, and other programs based on need. Most respondents envisioned an EBT system combining use of POS terminals at retailer outlets with ATMs for access to cash assistance benefits. Respondents also indicated that, whenever possible, they would prefer to integrate with existing commercial POS networks. In addition, some respondents indicated that while they would contract with vendors to provide specialized EBT system services, the State Agency would remain in control of eligibility determination and benefit authorization. Others envisioned that an EBT system primarily would be run by the State.

Several respondents indicated that they would consider off-line EBT systems, or a combination of on-line and off-line systems, especially for use

[1] Issuance cost and loss data were obtained from the "State Tables of Activity Ranking, Plus," Food Stamp Program, Food and Nutrition Service, April 1988.

in rural areas. Respondents reported that commercial vendors for off-line systems are actively promoting the use of off-line, "smart card" type systems as a means of avoiding problems with on-line systems in rural areas (e.g., telecommunications barriers and on-line terminal transaction costs.)

In response to interview questions concerning the possibility of a national (i.e., Unitary Design) EBT system, officials indicated a range of views regarding the potential implications of such a system. Most respondents indicated a high degree of uncertainty regarding the impacts such a system might have on their States. On the whole, State officials indicated that they would need to learn considerably more about such a proposed system (especially insofar as such a system would affect their own States) before providing a definitive opinion on the merits of such a concept. In addition, respondents interpreted the role of the States and FNS in a national EBT system quite differently. Some officials thought that food retailer management would be done at the Federal level and were very concerned about the effectiveness of support for small-scale grocery stores in such a system. This difference in interpretation of how a national EBT system would work may explain some of the differences in responses.

Some respondents indicated that they could be enthusiastic about the concept of a single, unified, nationally-operated EBT system. These officials indicated that they believe a national EBT system would ultimately prove to be the most streamlined and cost-effective system design available. These respondents observed that the Food Stamp Program is, after all, a national program, and that a national system should be technically feasible.

Many respondents, however, expressed a number of concerns about the potential complications a national EBT system might create. These respondents expressed considerable skepticism regarding the capacity of such a system to process data in a consistently accurate fashion, given the magnitude of the system's central database (or regional databases), and the possibility of relatively minor data errors leading to very large complications. Finally, respondents also expressed concern over issues involving the authority of State Agencies to fully oversee State program operations, and the need for flexibility to meet the needs of different States. Respondents indicated that any national EBT system should allow for the administration of multiprogram EBT systems to allow States to reduce transaction costs and to streamline administration of assistance programs.

Although it is clear that States generally support the basic movement toward EBT systems, State officials indicated that their main focus is currently at the State level rather than at the regional or national level. Respondents frequently indicated a preference for a decentralized approach toward the development of EBT systems, providing States with maximum flexibility to design systems to meet the needs of the individual States. Respondents expressed considerable concern that in a national EBT system, FNS might overlook the particular efforts, peculiarities, or needs of individual States. Most respondents indicated that they preferred maximum Federal assistance in moving toward EBT systems combined with maximum flexibility to design and operate such systems.

7.5 SUMMARY

The number of debit terminals deployed by commercial POS networks in supermarkets and convenience stores has grown to over 20,000. Yet, despite steady growth, commercial POS activity remains concentrated in only a few States. While commercial POS networks will continue to expand, it seems unlikely that widespread use of commercial debit cards in food retailing will occur in more than a few States in the next couple of years.

The deployment of commercial debit terminals in a State does not appear to be a major influence on the level of interest in EBT among State officials, in part because of the limited coverage of commercial POS networks to date. Of the 17 States that appear actively interested in EBT, more than half have little or no commercial POS activity in food retailing in the State. Over the next few years, implementation of State EBT systems and expansion of commercial POS networks may occur simultaneously in some areas, and State implementation of EBT systems may stimulate the growth of commercial networks.

While most of the State Agency officials who were interviewed expressed support for the concept of an EBT system, they identified a number of obstacles and concerns impeding them from pursuing EBT systems at the current time. Funding and personnel constraints, lack of interest and coordination among other Agencies within the State, and concerns about impacts on food stamp recipients were frequently cited as obstacles to EBT development in the near term.

Most State officials seem interested in eventually implementing EBT systems in their States, despite being aware of both the costs and benefits of EBT systems. Officials see EBT systems as the "wave of the future" and potentially very beneficial to the public images of their programs and to recipients, food retailers, and banks. More States are likely to adopt EBT systems as they are shown to be feasible to administer and cost-efficient to operate.

The interviews with State officials suggest that a number of States will pursue EBT initiatives and are likely to implement EBT systems without further impetus from FNS (assuming no unforeseen problems, such as large increases in EBT costs). A number of States, perhaps as many as 17, may be ready to implement EBT systems within about three years. On the other hand, it also appears that some States are unlikely to implement EBT systems on their own without increased support from the Federal government. A number of States are interested in EBT systems, but cannot move in that direction until funding increases, personnel constraints ease, or other obstacles are removed.

Chapter Eight

ECONOMIC FEASIBILITY

An EBT system offers many potential advantages to the Food Stamp Program. The technology enables better administrative control over the issuance and redemption of benefits, potentially reducing administrative error and benefit loss and diversion. It also facilitates the integration of services across multiple assistance program. In addition, by making use of a payment system which can be integrated with existing commercial systems, an EBT system can reduce the stigma often associated with program participation. Finally, an EBT system's elimination of paper food stamp coupons and associated paperwork can reduce the costs which recipients, retailers and financial institutions incur to participate in the Food Stamp Program.

Offsetting these advantages is the estimated cost of implementing and operating a nationwide EBT system. As presented in this chapter, these costs are relatively high. Thus, when assessing the overall feasibility of a nationwide EBT system, program officials will need to weigh these costs against the tangible and intangible benefits of an EBT system.

8.1 RESEARCH METHOD AND HIGHLIGHTS

Before presenting the details and results of the cost analysis, our overall approach to estimating system costs should be noted. Federal and State Agencies will take a very cost conscious attitude toward the design, development, implementation and operation of a nationwide EBT system. Where design choices can lead to savings without reducing system integrity or program accountability, these cost-reducing options will almost certainly be adopted. The cost analyses also consider the benefits of an EBT system which will accrue to retailers, financial institutions, and operators of POS and ATM networks. To achieve these benefits and maximize the economic feasibility of a nationwide EBT system, these private sector participants will have to acknowledge such benefits and be prepared to negotiate with Federal and State authorities.

In estimating the costs of a nationwide EBT system, we have made several assumptions about the design of the system. These assumptions are discussed below. The section then explains how system development,

implementation and operating costs are estimated. The section concludes with a summary of the results of the analysis.

SYSTEM DESIGN

In keeping with the focus of this report, this chapter estimates the costs of implementing and operating a nationwide, on-line EBT system. Until the off-line EBT demonstration is completed, little empirical data exist for estimating the costs of an off-line system.

For purposes of cost estimation, we also assume that a nationwide EBT system would include both the Food Stamp Program and the AFDC program. If other cash assistance programs were added to the system, total development and operating costs would increase, but per-case-month costs should decrease. Because AFDC is the largest cash assistance program, however, its inclusion should indicate the major cost effects of adding cash assistance to a nationwide EBT system.

We also assume that a nationwide EBT system will be integrated as much as possible with commercial ATM and POS networks. Such integration will reduce software development costs. It also makes use of existing ATMs and POS debit card terminals and those likely to be deployed in the near future, as well as the telecommunications infrastructure supporting those devices. In addition, integration allows system vendors to maximize transaction processing efficiencies by building on existing transaction volumes.

Finally, separate cost estimates are provided for three different approaches to system development: a "State-Initiated" approach and the regional and centralized versions of the Unitary Design approach. The State-Initiated approach includes both the Multiple and Standardized Design approaches described throughout the report. A single cost estimate is provided because we believe that development and operating costs of systems developed under the two approaches will be similar. In those few places where costs might differ, the chapter notes the direction and approximate magnitude of the cost difference.

COST ESTIMATION

Wherever possible, our approach to estimating system development, implementation and operating costs is to identify individual tasks which must be performed by FNS, the Family Support Administration (FSA) of the Department of Health and Human Services, State Agencies, local welfare offices, and system vendors. Once the tasks are identified, the costs of resources required to complete each task are estimated. These resources typically include labor, hardware, telecommunications support, and other material costs (e.g., card stock for EBT cards and training videos). Individual resource costs are then aggregated to obtain estimates of the total costs to develop, implement, and operate a nationwide EBT system.

In keeping with the above resource-inventory approach to cost estimation, the chapter refers to costs directly incurred by system participants, (i.e., FNS, State Agencies, local welfare offices, and vendors). This does not recognize that Federal Agencies would pay a portion of the States' administrative costs of developing and operating an EBT system. After the total costs of system development and operations are estimated, therefore, the chapter presents the relative shares of total system costs for which FNS, FSA and State Agencies would be responsible.

Hardware costs represent a substantial portion of the total costs of an EBT system. Although this hardware needs to be purchased before a system begins operating, we amortize all hardware costs over the estimated useful life of the equipment, treating these costs as operating expenses. This recognizes the fact that, after a number of years of system operations, hardware will need to be replaced.

A major factor affecting the estimated costs of implementing and operating a nationwide EBT system is the number of commercially deployed POS terminals the system can use. To date, about 20,000 commercial terminals have been deployed in Food Stamp Program-authorized stores--a small fraction of the estimated 577,200 terminals a nationwide system might require. The cost analyses presented in this chapter assume that commercial POS networks will deploy about 50,000 terminals in program-authorized stores before an EBT system is implemented. While this projected increase is substantial, the POS industry projects a 43-percent increase in deployed terminals (across all stores) within the next year alone. If the annual growth rate in deployed

terminals in program-authorized stores averages only 20 percent over the next five years, nearly 50,000 terminals will be deployed.

The analysis relies on a number of different data sources when estimating the costs of individual resources. These data sources include interviews with representatives of the POS industry, interviews with FNS administrators, and cost data collected during the evaluations of the Reading EBT demonstration and the State-initiated EBT demonstrations.

Finally, while the cost analyses are based on our best estimates of resource costs, some of the estimates are admittedly imprecise. Without developing a specific, detailed design for an EBT system, greater precision is difficult to achieve. Where appropriate, we have indicated areas of greatest uncertainty in the cost estimates. The sensitivity of the operating cost estimates to different cost assumptions is also discussed at the end of the chapter.

HIGHLIGHTS

Assuming that 50,000 commercial terminals are deployed, estimated design, development and implementation costs for a nationwide EBT system serving both the Food Stamp and AFDC Programs vary from $246 to $291 million for State-Initiated systems, from $241 to $286 million for Regional systems, and from $233 to $278 million for a National system. These costs do not include the purchase cost of system hardware. Amortized hardware costs are treated as a monthly operating expense instead. Estimated costs decrease by about $3 million for every 10,000 additional terminals (beyond the assumed 50,000) which might be deployed by commercial networks.

The range of costs provided for each development approach reflects uncertainty about the precise value of a key cost component (the average cost to deploy a POS terminal, excluding its purchase price). The range also reflects two different approaches to specifying the value of a recipient's personal identification number (PIN): selection of the PIN by the recipient during training, and assignment of a PIN value by the vendor prior to card issuance. The lower-cost estimate for each development approach assumes PIN assignment, which saves about $13.1 million because extra staff are not needed during training to encode PIN values on recipients' cards. While recipients may have an easier time remembering their PINs if they select them during

training, the lower-cost PIN assignment approach is being successfully used in commercial credit card and debit card applications.

The similarity in estimated costs across the three development approaches is striking. The similarity arises because several major cost components do not vary at all with development approach. Examples are recipient training and card issuance ($40 million for labor and materials when PINs are selected by recipients); retailer recruitment and training ($12 million); and, most importantly, terminal installation costs (an estimated average of $158 million, excluding the purchase price of the terminals).

FNS' share of total design, development and implementation costs ranges from $88 to $105 million in the State-Initiated approaches, from $86 to $102 million in the Regional approach, and from $83 million to $99 million in the National approach. State Agencies would be responsible for $116 to $144 million of the total costs, depending on development approach and whether the high or low estimate is used. FSA's share of total estimated costs varies from $34 to $42 million.

If terminals are not deployed in every lane of program-authorized stores, total system design, development and implementation costs could be decreased by $60 to $73 million. This reduction assumes that sufficient terminals would be deployed to meet expected peak usage of an EBT sytem.

Once a nationwide EBT system is implemented, estimated monthly Food Stamp Program costs range from $31.8 to $39.3 million, allowing for some uncertainty in estimates of individual cost components. FNS' share of these costs varies from $16.4 to $20.1 million. On an annual basis, FNS' share of administrative costs ranges from $197 to $241 million.

FNS and State Agencies currently pay an average of $3.00 per month to issue and redeem program benefits for each food stamp household. Estimated monthly operating costs in a nationwide EBT system are higher. Monthly costs range from $4.51 to $5.57 per food stamp household. Costs are nearly identical across development approaches; the variation arises from uncertainties in the estimation of individual cost elements and whether PINs are assigned to or selected by recipients.

The above range in estimated monthly costs per food stamp household is based on a number of assumptions about system usage patterns and policy

decisions made to date regarding system design and terminal deployment. If terminal deployment decisions are based on expected peak usage levels and if other important assumptions are allowed to vary (e.g., the number of commercially deployed terminals and the average number of EBT transactions households make each month), monthly Food Stamp Program costs range from as low as $3.36 per case to as high as $6.35 per case.

Despite the cost differential between coupon and EBT system costs, an EBT system can reduce recipients', retailers' and financial institutions' costs to participate in the Food Stamp Program. Furthermore, an EBT system can reduce levels of benefit diversion within the program by an estimated $2.45 per case month. Examples of benefit diversion include purchase of ineligible items, coupon trafficking, and using cash change from food stamp purchases to buy non-food items. While reductions in benefit diversions will not lower program costs, the first two activities violate program regulations, and all three reduce the program's ability to provide nutrition assistance to low-income households. Thus, an EBT system can increase general program integrity and effectiveness.

8.2 SYSTEM DESIGN, DEVELOPMENT AND IMPLEMENTATION COSTS

The major organizations incurring costs in the design, development and implementation of a nationwide EBT system are the respective Federal Agencies, individual State Agencies, and the vendors selected by either the Federal or State Agencies. Individual local welfare offices also will be involved with system development and implementation activities (especially recipient training and card issuance).

FOOD AND NUTRITION SERVICE

The Food and Nutrition Service's development and implementation costs are divided into labor costs and costs for technical assistance.

Labor Costs

Before an EBT system can be established as either a nationwide benefit issuance and redemption system or an alternative to the existing paper-based coupon system, FNS and other Federal Agencies need to perform the following tasks:

- A decision must be made about which development option to pursue.
- A final set of functional, special program and, if desired, performance requirements need to be established.
- If the Standardized Design approach is adopted, detailed design requirements must be promulgated.
- A number of policy issues need to be settled, including the number of terminals to be deployed; payment of fees, if any, to retailers with commercial POS terminals; and settlement procedures for drawing food stamp funds from the U.S. Treasury.
- As explained in Chapter 6, program regulations need to be revised. In addition, standard guidelines for system documentation, testing, and implementation need to be developed.
- If an EBT system is to include AFDC benefits, FNS needs to work with FSA to establish the details of a multi-program system.

It is difficult to predict exactly how much time and effort will be needed to complete these activities. Nevertheless, based in part on interviews with program staff and experience to date, we estimate that a total of four person years of FNS effort is needed. Approximately half of this effort would be required for rewriting program regulations. Because most of the effort is not sensitive to development approach, we use this time estimate for each of the possible approaches.

The above tasks do not include any time for monitoring individual State projects or for selecting and working with a national vendor or several regional vendors. In the State-Initiated approaches, we estimate an average time of 12 to 18 calendar months to design, develop and begin implementing a State-level system. Further, we estimate that one FNS staff person could manage two to three State projects at a time. Thus, we anticipate an average of five person months of FNS effort per State, or 265 person months overall for the 50 States, the District of Columbia, the Virgin Islands and Guam.[1]

[1]All cost estimates throughout the chapter are based on an EBT system involving these 53 State Food Stamp Agencies.

FNS review and oversight of State Agency efforts should be less in the Unitary Design approach, because system design and development efforts (at the State level) will be less. We estimate three person months of FNS oversight per State in the Unitary Design approach, or a total of 159 person months.

In the Unitary Design approach, however, FNS needs to procure the services of one or more vendors and then manage the vendors' contracts to design, develop and test the system. If one vendor is selected (the National approach), we estimate 30 person months of FNS management, including time to prepare the RFP and award the contract. If more than one vendor is selected, the amount of needed time increases, but probably not in proportion to the number of vendors selected. In the Regional version of the Unitary Design approach, therefore, we have allocated 84 person months of FNS oversight and management, assuming seven vendors. With seven vendors, each vendor would be responsible for authorizing the transactions of an average of a little more than 1 million food stamp recipients.

Exhibit 8-1 summarizes FNS' labor costs to prepare for and manage the implementation of a nationwide EBT system. The most effort (313 person months) is needed for the State-Initiated approaches, because FNS needs to spend more time dealing with each State Agency. The Regional approach requires more time (291 person months) than the National approach (237 person months), because FNS will be dealing with more than one vendor. Total estimated costs range from $1,088,100 to $1,418,100, which include salaries, fringe benefits, administrative overhead, and non-labor indirect costs.[1]

Technical Assistance Costs

We envision that FNS will choose to procure the services of one or more technical consultants to review system design plans and to monitor system testing. In the State-Initiated approaches, we have allocated an average of 30 days of consulting per State Agency, or 1,590 days of consulting for all 53

[1]In arriving at these cost estimates, we have assumed that most of the effort will be performed by staff in grade levels 12 and 13. See Appendix B for labor cost assumptions.

Exhibit 8-1

FNS DEVELOPMENT AND IMPLEMENTATION COSTS
(Person months and Cost)

	State-Initiated	Regional	National
FNS Labor Costs			
Preparatory Costs			
Establish policy	24	24	24
Rewrite regulations	24	24	24
Manage Vendors	0	84	30
Oversee State Activity			
Person months per State	5	3	3
Total person months	265	159	159
Totals			
Person months	313	291	237
Cost	$1,418,100	$1,352,700	$1,088,100
Technical Assistance Costs			
Person days	1,590	350	200
Cost	$954,000	$280,000	$160,000
FNS share of cost	$675,400	$198,200	$113,300
Total Costs to FNS	$2,093,500	$1,550,900	$1,201,400

Note: Appendix B provides information on assumed average monthly labor costs for staff performing each task.

sites. In the National approach, a total of 200 days of consulting is allocated. For the Regional approach, we have assigned 50 days of consulting per vendor, and again assume that the system will include seven vendors (leading to 350 days of consulting services).

The estimated average daily consulting fee is $600 in the State-Initiated approach and $800 in the Regional and National approaches. (We presume that the lower fee could be negotiated in the State-Initiated approach due to the large amount of work involved.) At these fees, total estimated technical assistance costs are $954,000 in the State-Initiated approach, $280,000 in the Regional approach, and $160,000 in the National approach.

In a Food Stamp/AFDC system, however, we believe it is reasonable for the technical assistance costs to be shared by FNS and FSA. If costs are shared on the basis of caseload (with costs for food stamp/AFDC households being shared equally by the two programs), FNS would be responsible for approximately 71 percent of the technical assistance cost.[1] The FNS share of the costs, therefore, would be about $675,400 in the State-Initiated approach, $198,200 in the Regional approach, and $113,300 in the National approach, as shown in Exhibit 8-1.[2]

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[1]The 71 percent figure is derived as follows. Approximately 43 percent of all food stamp households receive AFDC benefits, based on data from the Integrated Quality Control System (IQCS). About 80 percent of AFDC households receive food stamp benefits. With a food stamp (FS) caseload of 7,054,773 households and an AFDC caseload of 3,771,000 households, the food stamp share of total costs is:

$$((1 - .43)\ FS + (.43/2)\ FS) / (FS + (1-.8)\ AFDC),$$

which equals $.784\ FS / (FS + .2\ AFDC)$. The AFDC caseload count is 53.5 percent of the food stamp caseload count, so the food stamp share is:

$$.784\ FS / (1 + (.2)\ (.535))\ FS, \text{ or } .708.$$

The food stamp caseload figure represents a monthly average for Fiscal Year 1988, as reported in "Food Stamp Program State Activity Report," Food and Nutrition Service, August 1989. The AFDC figure represents a monthly average for FY 1989, as reported by HHS officials.

[2]Throughout the chapter, all State and national costs are rounded to the nearest $100.

Total estimated labor and technical assistance costs incurred by FNS during system design, development and implementation are $2,093,500 in the State-Initiated approaches, $1,550,900 in the Regional approach, and $1,201,400 in the National approach. Costs could fall somewhat in the State-Initiated approach if multiple State Agencies decided to implement one or more multi-state systems (an arrangement being considered by New Hampshire, Vermont and Maine). If a total of 48 rather than 53 State systems were being implemented, for instance, FNS' labor and technical assistance costs could fall by about $176,220.

FNS' labor and technical assistance costs in the State-Initiated approach would be somewhat higher than $2.1 million if the Multiple Design approach is followed rather than the Standardized Design approach. More time will be needed to review system design plans and monitor system testing because the systems will be less uniform. If FNS' effort monitoring design and development increases from five to six months per project, and required technical assistance increases from 30 days to 40 days per project, FNS' share of estimated costs increases by about $463,600, to a total of $2,557,200.

STATE AGENCIES

Labor Costs for System Design and Development

In the Multiple and Standardized Design approaches, State Agencies will take the lead in responding to changes in program regulations allowing the implementation of an EBT system. We assume that State Agencies will procure the services of one or more vendors to design and develop the system. We estimate that an average of about six person years (75 person months) of effort at the State level will be needed over about 24 to 30 calendar months. The first year would include initial "read-in" about EBT systems, writing an RFP for services to be provided by a vendor, and selection of the vendor. The remaining time would entail working with the vendor on system design and development and preparations for initial system implementation.

A possible breakdown of the State Agency resources required over this 24- to 30-month period is shown in Exhibit 8-2. The estimated total labor cost (including fringe and overhead) is $324,400. In arriving at this estimate, we have used data on monthly salaries from the various EBT demonstrations. Estimates of required time by position are based on demonstration data and our own judgment of required resources.

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Exhibit 8-2

STATE AGENCY LABOR COSTS FOR SYSTEM DESIGN AND DEVELOPMENT
(Person months and Cost)

	State-Initiated	Regional	National
Project Director	20	12	12
Financial Management	6	4	4
Contracts	6	4	4
Program Heads			
Food Stamp	4	3	3
AFDC	3	2	2
Analyst	14	6	6
Data Processing			
Lead Analyst	8	6	6
Programmer	6	3	3
Secretary	8	4	4
Total Person Months	75	44	44
Total Labor Costs	$324,000	$199,600	$199,600

Note: Appendix B provides information on assumed average monthly labor costs for staff in each position.

Labor costs at the State level will be less in either the Regional or National version of the Unitary Design approach. Because FNS already will have selected a vendor for database management and transaction authorization, the State does not need to procure and work out the details of a system design. The State, however, will need to work with the vendor to design the interface between the State's food stamp and cash assistance issuance files and the vendor's procedures for updating client accounts with issuance data. A similar interface will need to be developed for State Agency and local office access to the vendor's database for necessary on-line administrative functions. Finally, the State Agency and the vendor will have to reach agreement on the content and format of summary activity and reconciliation reports that will be provided by the vendor. As shown in Exhibit 8-2, the estimated labor is 44 person months and the estimated cost is $199,600.

Labor Costs for System Implementation

Once the basic system has been designed, developed and tested, the State Agency will have to assist and monitor system implementation activities as individual local welfare offices are converted from the coupon system to the EBT system. This assistance could include general briefings to local office workers about system design and operations, explanations about changes in office operating procedures, and discussions about procedures for training recipients. More detailed instructions about card issuance and recipient training could be provided by State staff or vendor personnel.

We estimate that the State Project Director and one assistant (a local office "liaison") could perform the above activities plus some monitoring of actual implementation with a combined effort of about one person month per office. The assistance and monitoring would be spread over four to five calendar months as the office prepared for implementation and then trained recipients and issued cards. With an average of nearly 68 local offices per State Agency, the cost of this effort (at the State level) would average about $282,200.[1]

[1]With an estimated 3,592 local offices nationwide, the average number of offices per State Agency is 67.77

In the State-Initiated approaches, the State's vendor will be responsible for retailer recruitment, terminal deployment and retailer training--tasks for which FNS' vendor will be responsible in the Regional and National approaches. State Agency oversight of these tasks is expected to add an average of about eight person months of effort at an estimated cost of $33,200, raising State Agency implementation costs from $282,200 to $312,600 in the State-Initiated approaches.

Training Materials

Prior to the start of recipient training, the State or its vendor must prepare a training curriculum and training materials. We also assume that the State or vendor will prepare a videotape or slide show to assist in training. In the Regional and National approaches to system development, the system vendor will have to work closely with the State Agency during preparation of the training materials.

Even in the State-Initiated EBT systems, individual vendors may be providing services to more than one State Agency. Thus, training materials prepared for one site may be applicable--with minor modifications--to other sites, thereby reducing overall preparation costs. We assume that an average of about two person months of effort will be needed to prepare a curriculum and training materials (including translation of written materials into Spanish and other languages, where necessary). The videotape or slide show will cost about $50 per local welfare office to copy and distribute. Finally, we have allocated $.50 per recipient to cover the cost of training materials to be handed out at training sessions.

For an average State Agency with about 133,100 food stamp cases and 71,150 AFDC cases, the total costs for curriculum preparation and materials would be about $92,000, or $4,874,100 nationwide. This estimate includes a 10-percent indirect cost factor applied to purchased materials. It is based on an average of 147,330 recipients in each State Agency needing training (i.e., the 133,100 food stamp cases plus the 20 percent of the AFDC caseload--14,230 recipients--which does not receive food stamp benefits).

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General Planning Labor

As a State Agency and a vendor progress through system design and development, they will need to consult with at least some local offices to gain input on and test the design of workstation software for handling EBT administrative functions. As time for system implementation approaches, however, local office involvement will increase. Local office staff will need to be briefed on the new system, and plans for card issuance and training activities will need to be made. Some realignment of office space may be needed, and the responsibilities of some staff members will change. While many people at a local office may be involved in these activities, we estimate that the equivalent of one person month of effort will be needed. With an average of nearly 68 offices per State, average total labor costs per State Agency are estimated at $237,200.

Card Issuance and Training

An EBT access card needs to be issued to each EBT recipient, and recipients need to be trained in how to use the system. For system start-up, the State Agency could contract with its vendor to perform both card issuance and recipient training. Alternatively, these tasks could be performed at the local offices. Although the State-initiated EBT demonstrations now in progress are using vendors for initial card issuance and training, we assume that--in a Statewide implementation--it will probably be more cost-effective for each local office to handle both initial and ongoing card issuance and training.

It is assumed that local offices will train recipients in group sessions, and that cards will be issued and encoded during these sessions. Initial training and card issuance costs, therefore, will be directly affected by how many clients are trained during each session and how many staff will participate in the training sessions. Based on the Reading EBT demonstration, we have assumed that an average of 20 clients will be trained per session, that the sessions will last an average of about one hour,[1] and that a total of

[1]We estimate that training sessions for NPA (or food stamp only) cases will average about 45 minutes, while training for PA food stamp cases (which must include training on ATM usage) will average 1.25 hours.

four person hours of local staff time will be required for each session. The four staff would include two trainers (a lead trainer and an assistant), one clerk encoding cards, and one clerk handling client appointments for the session and followup of no-shows.

With an average office caseload of about 1,970 food stamp cases and 1,050 AFDC cases, about 2,180 recipients need to be trained.[1] Thus, an average local office will need to complete about 109 training sessions during system implementation. The estimated total labor cost for initial card issuance and training (allowing 15 minutes for breaks between sessions) is $9,676, or about $655,800 per State Agency.

In addition to labor costs, the State will have to purchase standard magnetic stripe cards from a vendor. We anticipate that the State will send a file to the vendor giving information to be encoded on the card's stripe. The vendor will then send the encoded cards to either the appropriate local offices or the State Agency for distribution. During training, the client's selected PIN will be encoded (in encrypted form) on his or her card.

Based on interviews with industry representatives, the costs of procuring encoded cards from a vendor should run about $0.50 per card for non-embossed cards to $0.80 for embossed cards. These figures assume high-volume orders; low-volume orders would average between $2.00 and $3.00 per card. We assume an average total cost of $0.70 per card for non-embossed cards, or an average of $1,522 per office. The extra cost ($.20 per card) is added to cover the State Agency's costs of preparing tape files of client information for use by the card vendor, as well as an indirect cost factor of 10 percent for purchased materials.

Total costs for card issuance and training during system implementation sum to an average of $11,200 per office, or $40.2 million nationwide.

These card issuance and training costs could be reduced by about $13.1 million if the vendor assigned PINs to recipients rather than letting recipients select their own PINs. Training sessions could be about 15 minutes

[1]Nationwide, about 20 percent of AFDC households (or an average of 210 households per office) are not food stamp households. Adding these 210 cases per office to 1,970 yields 2,180.

shorter, and no card encoding would need to be done at the local office. Whether recipients would have difficulty remembering assigned PINs is an open question; this approach has not been tested in any EBT demonstrations. Some banks, however, use this approach for bank debit cards without serious difficulty. PIN assignment is also used in many credit card applications.

Telecommunications Costs

Each office's EBT workstation will need telecommunications access for setting up card and account information on the vendor's EBT database. The most secure access would be provided by leased lines. These lines, however, are quite expensive to install (an estimated average of $3,500 per office) and use (estimated monthly charges average $1,500 per line). We therefore assume that existing dial-up lines will be used, with encryption devides being used to ensure secure communications for sensitive data. The estimated amortization and maintenance costs for encryption devices (and workstations) are included in Section 8.3's estimation of monthly operating costs.

Each local office will incur telecommunications costs to set up card and account information during system implementation. Assuming a 20-minute call costing an average of $5.00 during each of 109 training sessions, total costs per office are $545, or $600 after applying a 10-percent indirect cost rate. Average costs per State Agency are $40,700. Nationwide, local office telecommunications costs during implementation are $2,155,200.

Summary of Local Office Costs

Exhibit 8-4 presents the summary of local office development and implementation costs. If PINs are selected by recipients and encoded during training sessions, total costs per office average $15,298. With about 68 offices per State Agency, total aggregated local office costs are $1,036,800. For all 53 State Agencies, total estimated local office costs for system implementation are $55.0 million. If PINs are assigned rather than selected by recipients during training, total estimated local office costs fall to $41.8 million. State Agencies would be responsible for 50 percent of these local office implementation costs.

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Exhibit 8-4

SUMMARY OF LOCAL OFFICE DEVELOPMENT AND IMPLEMENTATION COSTS: ALL APPROACHES

	Per Office[a]	Per State Agency[b]	Nationwide
Labor Costs with PIN Selection[c]			
General planning	$3,500	$237,200	$12,572,000
Encoding clerk	$2,150	$145,700	$7,723,800
Trainer and clerks	$7,526	$510,100	$27,033,100
Subtotal	$13,176	$893,000	$47,328,900
Labor Costs with PIN Assignment[c]			
General planning	$3,500	$237,200	$12,572,000
Trainer and clerks	$6,021	$408,000	$21,626,500
Subtotal	$9,521	$645,300	$34,198,500
Card Stock	$1,522	$103,100	$5,466,300
Telecommunications	$600	$40,700	$2,155,200
Total Costs with PIN Selection	$15,298	$1,036,800	$54,950,400
Total Costs with PIN Assignment	$11,643	$789,100	$41,820,000

Notes: [a]Each office is assumed to include 1,970 food stamp cases and 1,050 AFDC cases.

[b]Assumes 67.77 local welfare offices per State Agency. Statewide costs have been rounded to the nearest $100.

[c]Appendix B provides information on assumed average monthly labor costs for staff performing each task.

Totals may not sum due to rounding.

SYSTEM VENDORS

Vendor costs for system design, development and implementation are divided into five components: design and development costs, retailer recruitment, network entry fees, terminal deployment, and retailer training. Even within a single State, these costs may be spread across multiple vendors.

Design and Development Costs

In the State-Initiated development approaches, the State Agency will contract with a vendor to design and develop the EBT system. It is very difficult to estimate how much vendors will charge for software development and testing. Vendor charges will depend in part on their existing software and hardware, and the length of their contract to operate the EBT system. Contract length is important because we anticipate that the costs of any hardware acquisition or upgrades will be incorporated into the vendor's monthly charges to the State for system operations. If the contract length is short, the "amortization" period for these hardware costs may not be sufficient, in which case the vendor might need to increase his upfront development charges.

Based on interviews with industry representatives, we estimate that an average vendor cost for system design and development will be in the order of $150,000. This figure covers the vendor's costs to meet with State officials to determine final system design, to modify existing POS and ATM application software, to develop software for local office workstations, and to test the resulting system. It does not include network entry fees or costs for retailer recruitment or terminal deployment. Nor does it cover costs for hardware acquisition or upgrades. As explained above, we assume that a vendor will cover hardware costs through monthly charges for system operations.

The $150,000 estimate is admittedly low for the first State Agency a vendor works with, but we anticipate that a majority of the States may contract with a limited number of vendors. Once these vendors have modified their POS software to meet EBT requirements, their design and development costs for subsequent States will decrease. Our figure of $150,000, therefore, represents an average cost across all States.

In the National approach, we estimate that the vendor's cost to develop the basic processing capability will be in the range of $3.0 million,

with an additional cost of about $30,000 per State Agency to develop an interface with each Agency's processing system. In the Regional approach, each vendor will have to design and develop its own system. Assuming seven regional vendors and about $1.5 million in costs for each vendor, total costs would reach $10.5 million, plus $30,000 per State Agency. As with the estimate of design and development costs in the State-Initiated approaches, these latter cost estimates are based on interviews with industry representatives. Development costs for the National system are considerably higher than for any individual Regional system due to the greater processing and database management complexities introduced with a very large system.

Summing vendor design and development costs for all 53 State Agencies, the costs would be $8.0 million for the State-Initiated approaches, $12.1 million for the Regional approach, and $4.6 million for the National approach. Costs for the Regional systems would decrease somewhat if one vendor were selected to serve more than one region.

Retailer Recruitment

A major implementation task in each approach to system development is contacting and recruiting retailers to participate in the system. In the State-Initiated approaches, the State Agency's vendor will be responsible for retailer recruitment. In the Regional and National approaches, the Federal vendors (or their subcontractors) are responsible. Regardless of who is responsible, however, approximately the same amount of effort will be required in each approach.

An average of over 4,100 program-authorized retailers are located within each State or State Agency jurisdiction. We estimate that retailer recruitment in each development approach will require an average of 18 person months of vendor labor per State Agency. During this time the vendor will send contact letters to each retailer explaining the planned system and asking for their participation. A series of meetings in each market area probably will be needed to answer questions. Contracts then need to be negotiated with each retailer or, in the case of retailer chains, with headquarters personnel. While the estimate of 18 person months may seem high, the vendor will have to address many questions during contract negotiations, including how the new system will interface with operations of existing or planned commercial POS

are responsible for paying 50 percent of these program costs, as well as their own directly incurred costs. State Agencies pay the remaining costs.

As shown in Exhibit 8-7, FNS' share of total design, development and implementation costs varies from $83.3 to $104.7 million, depending on development approach and whether the high or low cost estimates are used. FSA's share of total costs varies from $33.9 to $42.2 million, but this does not include costs directly incurred by FSA (which have not been estimated). State Agencies would be responsible for paying $115.9 to $144.3 million, or an average of $2.2 to $2.7 million per State Agency.

8.3 MONTHLY SYSTEM OPERATING COSTS

This section estimates monthly system operating costs in the State-Initiated, Regional and National approaches. As with Section 8.2, the discussion is organized around costs directly incurred by Federal, State and local agencies and by the system's vendor(s). The section concludes with an estimation of the system operating costs charged to each program and agency.

FOOD AND NUTRITION SERVICE

FNS' operating costs can be divided into labor costs and the costs of hardware amortization and maintenance.

Labor Costs

FNS will need to monitor the operations of an EBT system in each development approach. Monitoring activities, however, can be split between national headquarters and the seven regional offices.

In the Regional and National systems, national headquarters staff will need to manage the vendors' contracts with FNS. In all three development approaches, staff will need to review system activity reports prepared by the vendors and monitor system reconciliation and settlement. Finally, there is likely to be an ongoing need for review and interpretation of FNS policy and regulations as they pertain to EBT systems.

At the regional offices, FNS staff will review system activity and reconciliation reports, providing input to national staff review of similar (but presumably less detailed) reports. Regional staff might also be

responsible for monitoring system performance, both as indicated in system reports and as reported by State Agencies. Finally, regional staff could be responsible for resolving most disputes that might arise between State Agencies and system vendors, particularly in the Regional and National systems where States are interacting with vendors selected by FNS. Some of these disputes might have to be passed on to national headquarters for final resolution.

Based on interviews with program staff and our own judgment about required resources, we estimate that national headquarters will need to commit the equivalent of about four full-time staff to monitor a National EBT system. This estimate includes one full-time equivalent (FTE) to manage the vendor's contract; somewhat more than one FTE to review system operations, settlement and reconciliation; somewhat less than one FTE to review and interpret program policy in light of EBT operations; and about one FTE for administrative supervision and clerical support.

More time (the equivalent of six full-time staff) will be needed in a Regional system because more vendors are involved in system operations.

In the State-Initiated approaches, we estimate a total need for f. full-time staff. While headquarters will not need to manage any vendor contracts in the State-Initiated approaches, more attention will be needed to monitor system operations, reconciliation and settlement.

Within each regional office, we estimate that a total of from 1.0 to 1.5 full-time staff will be needed to review system operations and performance and to handle State/vendor relations. More time is allocated in the State-Initiated approaches because more separate systems need to be monitored.

In addition to the above staff time, FNS will still be responsible for many aspects of retailer management. This includes authorizing new retailers, informing the vendors of retailers leaving the program, monitoring redemptions, and monitoring compliance. These tasks will be performed at field offices, national headquarters, and at the Minneapolis Computer Support Center. Based on data gathered during the Reading EBT demonstration, the estimated cost for these activities is $.128 per case month.

As shown in Exhibit 8-8, FNS' estimated monthly labor costs in a nationwide EBT system vary from $953,000 in the National approach to $973,200

systems. Evidence from the EBT demonstrations also suggests that vendors must be prepared to devote significant resources to this task. Estimated average costs per State Agency are $108,000, or $5.7 million nationwide.

Network Entry Fees

A basic assumption for the design of a nationwide EBT system is that it be integrated with commercial POS and ATM networks. Such integration will allow EBT participants to use already-deployed POS terminals and ATMs. Integration, however, requires that EBT vendors become members of the existing networks. ATM and POS networks typically charge card issuers a one-time entry fee for membership in the network. Thus, if an EBT system is to be integrated with existing ATM and POS networks, an allowance must be made for these entry fees.

Industry representatives suggest that membership in about 20 commercial networks would provide nationwide coverage for an EBT system. The average entry fee is about $15,000, or $300,000 for 20 networks.

Terminal Deployment

Terminal deployment will be the largest expense in the implementation of a nationwide EBT system. Even though the (amortized) purchase cost of the terminals is treated as an operating cost, other deployment costs remain quite high.

To estimate terminal deployment costs, we have divided deployment costs into the following components:

• average price of fully configured, dial-up terminal	$ 600
• average cost to install telephone lines	150
• average cost to provide electrical service	100
• average cost to physically install terminal	50
Total Average Cost	$ 900

The expected average total cost is therefore $900 per terminal, of which $300 is treated as an implementation expense and the remaining $600 is amortized.

In estimating the above costs, we have relied on industry estimates for each component. The terminal price is for a multi-function, 300-baud terminal which can support at least two programs (food stamps and AFDC). It also assumes a discounted price for high-volume orders. Telephone and electrical service costs depend upon the existing store environment; the estimated costs are projected averages, taking into consideration that some stores already will have sufficient telephone and electrical service. These costs also recognize that some large stores may not need telephone lines at each lane, opting instead to use a local area network (LAN) controller. The cost of installing a controller in multi-lane stores is reported to approximately equal the costs of installing individual telephone lines. The benefit of using a LAN controller is reduced monthly telecommunications costs rather than savings in installation fees.

Approximately 222,000 food retailers are authorized to participate in the Food Stamp Program. Using data from the Reading and State-initiated EBT demonstrations, we estimate that, on average, each retailer will have 2.6 lanes. If all lanes in each store are equipped, 577,200 terminals need to be deployed. Additional terminals may be deployed in non-food outlets to serve AFDC recipients, but this analysis does not take these terminals into account.

As explained in Chapter 7, the best estimate of the number of commercial POS terminals already deployed in food retail stores is about 20,000. Because it would take at least three to five years before a nationwide EBT system could be implemented, we assume that 50,000 commercial POS terminals would be deployed by that time. This estimate assumes an annual growth rate in commercially deployed terminals of a little over 20 percent. Although this growth rate is a bit higher than recent trends, the food retail store environment seems to be changing. Industry trade publications report substantially greater interest in POS debit card services among food retailers within the last year. Furthermore, once a few stores in a given market adopt POS debit, other stores will join in to remain competitive. Finally, the prospect of EBT deployment itself should encourage some retailers to sign on with commercial networks, thereby preparing themselves for an integrated POS/EBT payment service.

With 50,000 commercially deployed terminals, EBT system vendors will need to deploy an additional 527,200 terminals. Thus, the average number of

terminals to be deployed in each State is about 9,950. At an average deployment cost of $300 per terminal, total average deployment costs per State Agency are $2,984,200. Nationwide, the estimated deployment cost is $158.2 million.

In addition to terminal deployment costs, system vendors will have to ensure that the 50,000 commercial terminals can submit EBT transactions for authorization processing. This task is quite similar to developing an interchange capability between two POS networks. Because the number of commercial POS networks is relatively small, we estimate an average cost of $5,000 per State Agency (or $265,000 nationwide) for this task. Lower costs ($100,000 and $50,000, respectively) are estimated for the Regional and National approaches, due to the lower number of EBT vendors involved in these approaches.

Retailer Training

Each EBT system vendor (or its subcontractors) needs to train retailers in how to use the EBT system. As a first step, the vendor needs to prepare a training manual and training materials for the retailers. We have allocated an average of one month of effort per vendor for this task. We have also assumed an average of $0.50 per terminal for distributed training materials. With an average of 10,890 terminals per State (including commercial terminals), training materials will cost about $5,400.

A variety of retailer training approaches are possible. Training could occur within each store shortly after terminal installation. Alternatively, vendors could train representatives from each store in group sessions, with these representatives responsible for the training of other store employees. Finally, some store chains may wish to handle all training within individual stores themselves. With the diversity of market environments, it is likely that some combination of the above approaches will be used.

The most expensive approach to retailer training (i.e., vendor training within each store) would cost about $9.3 million nationwide. This estimate assumes that one person can train an average of four stores in one day. For those stores which already participate in a commercial POS network, training sessions can be shortened and an average of training in five stores

per day is assumed. For the more likely mixture of training approaches, we assume that total training costs nationwide could be reduced from $9.3 million to about $6.2 million, a 33-percent decrease. This estimate is fairly judgmental, inasmuch as the exact mixture of training approaches that vendors and retailers will adopt is impossible to predict.

Summary of Vendor Costs for Design, Development and Implementation

Exhibit 8-5 summarizes estimated vendor costs for the three development approaches. Average costs per State Agency vary between $3.0 and $3.7 million. Nationwide, estimated total costs vary from $159.5 million to $198.7 million.

The substantial range in estimated costs within each development approach is due solely to uncertainties over average terminal installation costs. At an estimated average cost of $300 per terminal, installation costs represent between 86 and 90 percent of total vendor costs, depending on approach. If the estimate of average terminal installation costs is off by as little as 10 percent, therefore, total estimated vendor costs change by $15.8 million. All industry representatives contacted found the $300-per-terminal estimate reasonable. Nevertheless, we have chosen to present high and low estimates for total vendor costs to acknowledge the impact of small changes in this particular cost component.

OVERALL SUMMARY OF DESIGN, DEVELOPMENT AND IMPLEMENTATION COSTS

Total costs for designing, developing and implementing a nationwide EBT system are summarized in Exhibit 8-6. For the State-Initiated approaches to development, total estimated costs vary between $245.8 and $291.2 million. The cost range for the Regional approach is $241.0 to $285.7 million. For the National approach, estimated costs vary between $233.1 and $277.8 million.

The variation in estimated costs within each approach reflects the effects of different design and cost assumptions. In each approach, the high estimate assumes PIN selection by recipients (a design feature which adds about $13.1 million to implementation costs) and an average terminal installation cost of $330. The low estimate assumes PIN assignment by the vendor and an average installation cost of $270 per terminal. Finally, in the State-Initiated approach, the high estimate also includes an additional $556,500 to

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Exhibit 8-5

SUMMARY OF VENDOR DESIGN, DEVELOPMENT AND IMPLEMENTATION COSTS
(Average per State Agency)

	State-Initiated	Regional	National
Labor Costs for Design and Development	$150,000	$228,100	$86,600
Retailer Recruitment	$108,000	$108,000	$108,000
Network Entry Fees	$5,700	$5,700	$5,700
Terminal Deployment			
Installation	$2,984,200	$2,984,200	$2,984,200
Network interface	$5,000	$1,900	$900
Retailer Training			
Preparation	$1,300	$600	$100
Training materials	$5,400	$5,400	$5,400
Training labor	$117,300	$117,300	$117,300
Average Total Cost per State Agency[a]			
High estimate	$3,675,300	$3,749,600	$3,606,600
Low estimate	$3,078,500	$3,152,800	$3,009,800
Total Cost for all 53 State Agencies[a]			
High estimate	$194,790,400	$198,729,400	$191,152,400
Low estimate	$163,158,400	$167,097,400	$159,520,400

Notes: [a]High and low estimates assume average terminal installation costs of $330 and $270 per terminal, respectively.

Totals may not sum due to rounding.

Exhibit 8-6

TOTAL SYSTEM DESIGN, DEVELOPMENT AND IMPLEMENTATION COSTS

	State-Initiated	Regional	National
FNS	$2,093,500	$1,550,900	$1,201,400
State Agencies	$38,774,000	$30,518,700	$30,518,700
Local Offices			
PIN selection	$54,950,400	$54,950,400	$54,950,400
PIN assignment	$41,820,000	$41,820,000	$41,820,000
Vendors			
High estimate	$194,790,400	$198,729,400	$191,152,400
Low estimate	$163,158,400	$167,097,400	$159,520,400
Total Costs			
High estimate[a]	$291,164,800	$285,749,400	$277,822,800
Low estimate[b]	$245,846,300	$240,987,400	$233,060,800

Notes: [a]The high estimate assumes PIN selection by recipients and an average terminal installation cost of $330 per terminal.

[b]The low estimate assumes PIN assignment by the vendor and an average terminal installation cost of $270 per terminal.

Totals may not sum due to rounding.

cover extra monitoring and technical assistance costs if the Multiple Design approach to system development is adopted rather than the Standardized Design approach.

The cost estimates assume that, by the time a nationwide EBT system is implemented, commercial POS networks will have deployed about 50,000 terminals in program-authorized stores. The remaining 527,200 terminals would be deployed by EBT system vendors. For every reduction of 10,000 terminals needing to be deployed, total costs fall by $2.7 to $3.3 million. Requirements for terminal deployment would fall if commercial networks deployed more than 50,000 terminals or if further study shows that terminals do not need to be deployed in every lane to meet peak volumes and to ensure recipient rights to non-discrimination.

One striking feature about Exhibit 8-6 is that system development and implementation costs do not vary much by development approach. Only a five-percent difference exists between the estimated costs of the State-Initiated and National approaches. The similarity among the estimated costs arises because many implementation tasks require the same level of effort regardless of development approach. Examples are terminal deployment, recipient and retailer training, general planning labor within local offices, and card costs. Taken together, these cost components represent about 80 percent of total costs.

Finally, although the cost estimates in Exhibit 8-6 are quite large, it should be noted that they are a one-time cost. In addition, it is likely that the costs would be spread over at least three to five budget years. Furthermore, the costs would be shared by 53 State Agencies and two Federal Agencies (FNS and FSA).

With respect to the sharing of costs among State and Federal Agencies, the figures in Exhibit 8-6 represent which agencies or organizations incur system design, development and implementation costs, not who is responsible for paying these costs. Exhibit 8-7 shows the allocation of total cost payments among State and Federal Agencies. The high and low estimates reflect the range in total costs discussed previously. In allocating total costs, all costs incurred by vendors and State and local agencies are first split between the food stamp and AFDC programs on the basis of caseload size, with 71 percent of the costs charged to the Food Stamp Program. FNS and FSA

Exhibit 8-7

ALLOCATION OF SYSTEM DESIGN, DEVELOPMENT AND IMPLEMENTATION COSTS AMONG FEDERAL AND STATE AGENCIES (Millions of Dollars)

	State-Initiated	Regional	National
FNS Share of Costs			
High estimate	$104.7	$102.2	$99.1
Low estimate	$88.4	$86.3	$83.3
FSA Share of Costs[a]			
High estimate	$42.2	$41.5	$40.4
Low estimate	$35.6	$35.0	$33.9
State Agency Share of Costs			
High estimate	$144.3	$142.1	$138.3
Low estimate	$121.9	$119.7	$115.9
Total Costs[a]			
High estimate	$291.2	$285.7	$277.8
Low estimate	$245.8	$241.0	$233.1

Note: [a]Excludes costs directly incurred by FSA, which have not been estimated.

in the State-Initiated approaches. Retailer management functions are the most expensive component of total labor costs.

Hardware Costs

With the implementation of a nationwide EBT system, we suspect that both the national and the regional offices will have a need for on-line access to the system's databases. At the regional offices, on-line access could be used to inquire into disputes between State Agencies and vendors over system accounts. State-level reports on system activity or performance could also be transferred over this access mode. Similar reports could be transferred to the national headquarters.

We assume that one on-line workstation at each regional office and two workstations at the national office will be needed. Existing equipment can be used for these needs, however, so no additional costs are assumed.

System vendors in each development approach will need to pass retailer redemption data to the Minneapolis Computer Support Center. Depending on the telecommunications protocols used by vendors, the computer center may need to purchase additional modems or other hardware to support this receipt of data. We have allocated $10,000 to cover these hardware costs. Using an amortization period of five years and a five-percent cost of capital, amortization costs for the hardware are $192.48 per month. Estimated monthly maintenance and service costs for the hardware are $79.00 per month, for a total hardware cost of $271 per month.[1]

If the workstations used leased lines to communicate with the vendors' databases, monthly telecommunications charges would be relatively high, on the order of $1,200 to $1,500 for each line to each vendor. Because the information to be passed to the workstations involves summary reports and other operating information, we believe that secure, leased lines are not needed. Regular dial access lines can be used, and monthly costs should be negligable. Thus, no telecommunications costs are included in the estimates of total monthly FNS costs.

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[1]Unless otherwise noted, monthly maintenance and service costs for all hardware are estimated at 0.79 percent of purchase price. This rate is used within the industry for estimation purposes.

Summary of FNS' Direct Administrative Costs

The estimated total monthly administrative costs incurred directly by FNS are presented at the bottom of Exhibit 8-8. Total monthly costs range from $953,300 in the National system to $973,500 in the State-Initiated systems.

FAMILY SUPPORT ADMINISTRATION

The estimated direct monthly administrative costs for FSA are presented in Exhibit 8-9. For each system approach, we have allocated one-third the time estimated for FNS at both the national and regional office levels. The reduction in time reflects the fact that State Agencies (in contrast to Federal staff) are relatively more involved in program management and policy determination in the AFDC Program than in the Food Stamp Program. Because FSA has 10 administrative regions, however, estimated regional costs are a bit higher. Total monthly costs range from $21,000 to $30,000.

STATE AGENCY COSTS

In an EBT system, State Agency costs will include labor, data processing costs, and telecommunications costs.

Labor Costs

In the State-Initiated EBT systems, we envision each State Agency needing an average of approximately 6.5 full-time equivalents of labor during system operations. This estimate is based partly on experience with the Reading EBT demonstration and partly on our own judgment of resources required to manage the operations of a Statewide EBT system. As shown in Exhibit 8-10, this labor includes 1 full-time project director, 1 full-time staff member responsible for liaison with local offices, 1 full-time member responsible for liaison with the vendor handling retailer activities, 1.5 programmer/analysts, 1 data processing clerk, and 1 full-time secretary. The programmer/analyst would be responsible for monitoring retailer settlement and system reconciliation, compiling program reports and maintaining the software interfaces for issuance files and workstation functions. The data processing clerks would handle the creation and transmission of daily issuance files, the

Exhibit 8-8

MONTHLY FNS DIRECT ADMINISTRATIVE COSTS

	State-Initiated	Regional	National
Labor Costs			
National Office			
Person months	5.0	6.0	4.0
Total costs	$24,000	$28,800	$19,200
Regional Offices			
Person months	10.5	7.0	7.0
Total costs	$46,200	$30,800	$30,800
Retailer Management[a]			
Cost per case month	$.128	$.128	$.128
Total costs	$903,000	$903,000	$903,000
Total Labor Costs	$973,200	$962,600	$953,000
Hardware Costs			
Modems			
Amortization cost	$192	$192	$192
Maintenance cost[b]	$79	$79	$79
Total cost	$271	$271	$271
Total FNS Costs	$973,500	$962,900	$953,300

Notes: [a]Includes national, field office and Minneapolis Computer Support Center costs.

[b]Includes indirect costs of 10 percent.

Totals may not sum due to rounding.

Exhibit 8-9

MONTHLY FSA DIRECT ADMINISTRATIVE COSTS

	State-Initiated	Regional	National
Labor Costs			
National Office			
Person months	1.7	2.0	1.3
Total costs	$8,000	$9,600	$6,400
Regional Offices			
Person months	5.0	3.3	3.3
Total costs	$22,000	$14,700	$14,700
Total FSA Costs	$30,000	$24,300	$21,000

Note: Totals may not sum due to rounding.

receipt of system data from the vendor, and any processing of that data to support the creation of program reports. Based on average state salaries for similar positions, total labor costs (including fringe and overhead) are estimated at $23,800 per month, or $1,261,400 for all 53 State Agencies.

Somewhat less State Agency labor should be needed in the Regional and National EBT systems, especially in the areas of monitoring retailer activities and the review of system operations. Thus, the staff member monitoring the vendor's interactions with retailers is no longer needed, and the number of required programmer/analysts drops from 1.5 to 1.0. This reduction in staff lowers average State Agency labor costs to an estimated $17,900 per month, or $948,700 for all 53 State Agencies.

Data Processing Costs

In each system option, the State Agency will need to create the food stamp and AFDC issuance files which will be transmitted to the EBT processing vendor. In addition, the vendor may pass EBT information back to the State Agency for further processing (for report generation, etc.).

With respect to creating issuance files, we assume an average of 1.05 food stamp and 1.5 AFDC issuances per month per household in the respective caseloads. Based on Reading data, we estimate a State's data processing costs at $.10 per issuance record. We also apply a 10-percent indirect rate to these data processing costs.

With about 7.1 million food stamp cases and 3.8 million AFDC cases nationwide, average total data processing costs for creating issuance files each month are estimated at $27,100 per State Agency, or $1,437,000 nationwide.

Lacking any empirical evidence on the costs to process and analyze EBT data received from the vendor, we have allocated $25,000 per month per State Agency, or $27,500 after a 10-percent indirect rate factor is applied. When these costs are added to the costs for creating issuance files, total average data processing costs per State Agency are about $54,600 per month, or $2,894,500 nationwide.

Exhibit 8-10

MONTHLY STATE AGENCY LABOR COSTS

	State-Initiated	Regional	National
Project director	1.0	1.0	1.0
Local office liaison	1.0	1.0	1.0
Retailer/vendor liaison	1.0	0	0
Programmer/analyst	1.5	1.0	1.0
Data processing clerk	1.0	1.0	1.0
Secretary	1.0	1.0	1.0
Total full-time equivalents	6.5	5.0	5.0
Total Labor Cost	$23,800	$17,900	$17,900
Total Cost for all 53 State Agencies	$1,261,400	$948,700	$948,700

Note: Appendix B provides information on assumed averge monthly labor costs for staff in each position.

Telecommunications Costs

Issuance files and other EBT data will be sent over a secure, leased line telecommunications link. Estimated monthly charges (including a 10-percent indirect rate) are $1,430 in the State-Initiated systems, $1,540 in the Regional systems, and $1,650 in the National system. The cost variation arises due to the longer average communications lines needed in the Regional and National systems. Nationwide, these monthly costs vary from $75,800 to $87,400.

Hardware Costs

We assume that each State Agency will have the necessary hardware to create the issuance files that need to be passed each day to the system vendor (for posting to recipient accounts). Depending upon the size of the State, each State Agency will probably need one or two workstations that are capable of providing on-line access to the system's database. We assume, however, that existing workstations can be used to provide the access. Thus, no hardware-related costs are estimated at the State Agency level.

Summary of State Agency Operating Costs

Exhibit 8-11 summarizes the estimated monthly costs incurred by a State Agency during operation of an EBT system. Estimated monthly costs range from about $74,000 in the Regional and National systems to $79,800 in the State-Initiated approaches, with variation in labor costs causing the overall differences. For all 53 State Agencies, monthly operating costs vary from $3.9 million to $4.2 million.

LOCAL OFFICE COSTS

Upon the implementation of an EBT system, local welfare offices will incur costs associated with client training, card issuance, and maintaining a recipient hotline to answer questions and resolve problems. Additional costs will be incurred as income maintenance workers, clerks and supervisors handle day-to-day administrative functions associated with benefit issuance. Inasmuch as these tasks are not affected by development approach, the estimated costs for performing the tasks are the same in the State-Initiated, Regional and National systems.

Exhibit 8-11

MONTHLY STATE AGENCY OPERATING COSTS

	State-Initiated	Regional	National
Labor	$23,800	$17,900	$17,900
Data Processing	$54,600	$54,600	$54,600
Telecommunications	$1,430	$1,540	$1,650
Total State Agency Costs	$79,800	$74,100	$74,200
Total Cost for all 53 State Agencies	$4,231,700	$3,924,900	$3,930,700

Notes: All costs are rounded to the nearest $100.

Totals may not sum due to rounding.

Client Training

Client training for an EBT system requires access to POS terminals and an ATM trainer so that recipients can see the equipment they will be using and practice using the equipment. This requirement means that it would be difficult to train recipients individually as they apply for benefits. Instead, it will be more efficient to train new recipients in group sessions.

The key variable in estimating client training costs, therefore, is the number of weekly training sessions scheduled by the local office. Because training sessions need to be held frequently to ensure that expedited service cases have access to their benefits within five days of application, we assume that a minimum of two training sessions per week is needed. Larger offices with caseloads exceeding 3,500 may need more than two sessions to avoid scheduling too many clients to a single session. We have therefore assumed an average of 2.5 training sessions per week per office, or 10.8 training sessions per month.

With an average monthly intake rate of 5 percent of the current caseload, approximately 352,700 food stamp recipients and 188,600 AFDC recipients nationwide will need EBT training each month. If an average of 80 percent of the AFDC clients also receive food stamps, the total number of clients needing training is 390,400. With 3,592 offices and an average of 10.8 training sessions per office, the average size of each group to be trained is a little over 10—a very manageable size. The relatively small average group size arises because small offices still need to schedule two sessions a week to meet expedited service requirements.

Labor Costs. We assume that two office staff (a lead trainer and an assistant) will be present during each training session and that sessions will last about one hour. Total nationwide labor costs for training are estimated at $1,924,400, or about $36,300 per State Agency. On a per office basis, average monthly labor costs for training are $536.

Unlike labor costs for training during system implementation, we have not allocated one hour per session for a clerk to schedule appointments. We expect that scheduling will occur as clients complete the intake process.

Materials Costs. We have allocated $0.50 per client ($0.55 after applying an indirect cost factor of 10 percent) for training materials to be handed out during training. These material costs will average about $60 per office per month, $4,100 per State Agency, and $214,700 nationwide.

Hardware Costs. Each office is assumed to have three EBT terminals for use during training. With an estimated purchase price of $600 per terminal, the monthly amortization cost per terminal is $11.55 (assuming a five-year amortization period and a five-percent cost of capital). The estimated monthly service and maintenance cost is $11.00 per terminal.[1] The total cost per terminal is therefore $22.55 per month, or $67.65 per office with three terminals. Average terminal amortization and service costs for training terminals are $4,600 per State Agency, or $243,000 nationwide.

Estimated monthly amortization costs for a $3,000 ATM trainer are $57.74, using a five-year amortization period and a five-percent cost of capital. Maintenance costs are estimated at $23.70, or $26.07 after indirects are applied. With one ATM trainer per office, total monthly costs are $83.81 per office. At the State Agency level, these costs would average $5,700 per month. Nationwide, estimated monthly costs are $301,000.

Card Issuance

Card issuance costs will vary depending on whether PINs are assigned (and encoded on the card) prior to training or selected by clients during training. If the latter, then a card encoder must be installed in each office and an encoding clerk must be present during each training session. Estimated costs for both approaches are presented below.

Labor Costs. If PINs need to be encoded on cards during training, estimated monthly labor costs for card issuance are $769,200 nationwide, $14,500 per State Agency, and $214 per office. If PINs are pre-assigned, no

[1]The $11.00 monthly service cost includes a 10 percent indirect cost allocation. This is the only hardware for which we do not use an estimate of 0.79 percent of purchase price for monthly service costs. (Estimated costs would be $6.09 per terminal with the 0.79 percent rate.) Industry representatives gave a range of from $3 to $35 per month for terminal maintenance costs. The $11.00 figure represents our best judgment as to average monthly service costs.

labor is needed. Cards could be handed out in sealed envelopes during training, with the pre-assigned PIN listed on an insert in the envelope.

Card Stock. EBT cards need to be issued to new clients and to those who report their cards as lost, stolen or damaged. Based on experience in Reading and Ramsey County, we estimate that 3.5 percent of the EBT caseload will need replacement cards each month. Adding this 3.5 percent figure to the 5 percent intake rate yields an average of 663,800 cards to be issued across the country each month.

We estimate the average cost of pre-encoded card stock at $0.50 per card, or $0.55 after applying indirect costs. This estimate is less than the $0.70 cost assumed for initial card issuance. The difference arises because the State Agency will not incur costs preparing and sending a tape file of client information to the card manufacturer.

Hardware Costs. With PIN selection by the client, each office will have one card encoder costing an average of $2,800 (which includes a data encryption device for data transmission). With an assumed amortization period of five years and a five-percent cost of capital, the monthly cost of the encoder is $53.89. Monthly maintenance costs are estimated at $22.12, or $24.33 after applying the 10-percent indirect cost factor. Thus, total monthly costs are estimated to be $78.22 per encoder. For all offices within a State, the average hardware costs will be about $5,300 per month, or $281,000 nationwide. Hardware costs are zero if PINs are pre-assigned.

Recipient Hotline

Recipients participating in an EBT system will need a telephone "hotline" to call to report lost or stolen cards or to report problems they are having with the system. Hotline operators could be located within each local office, or the State Agency could set up a centralized or a few regional hotline centers. Total staffing requirements would be nearly the same regardless of approach because the number of calls to be handled will be the same. Because higher telecommunications costs would be incurred with regional offices or a central hotline office (e.g., toll-free "800" numbers would need to be established), we assume that each local office will provide a hotline number for its caseload.

If recipients call the hotline during hours when local offices are not staffed, we assume that the calls will be routed to the State Agency's data processing center for resolution. The time to respond to these calls is already incorporated in the previous estimates of State Agency labor costs.

In providing hotline services, local offices will incur labor, hardware, and telecommunications costs.

Labor Costs. It is difficult to estimate just how much time will be needed to handle incoming calls on the recipient hotline. Experience from the Reading EBT demonstration suggests that relatively few calls will occur--the average number of calls each month is less than one percent of caseload size. In contrast, the Ramsey County demonstration receives over 1,500 calls each month from a caseload of about 10,000 cash assistance recipients. The majority of these callers request information on account balances.

We estimate that, for an average-sized office, total labor requirements for the hotline are 10 percent of one person's time, or about $260 per month. For the average State Agency, hotline labor costs equal about $17,600 per month. Nationwide, monthly labor costs for providing recipient hotline services are $933,900. Because hotline services are often provided in the present coupon-based issuance system, a portion of the EBT hotline costs simply replaces costs which are already being incurred.

Hardware Costs. Hotline staff will use EBT workstations to access the vendor's EBT database to inquire about transaction histories and account balances, or to place holds on accounts when cards are reported as lost or stolen. These workstations also will be used for other administrative functions (e.g., setting up new accounts). We estimate that an average-sized office will need one workstation to perform the above activities. Some small offices may not need any workstations (staff could call a district or State office to gain access to the EBT system), but large offices will need more than one workstation. Nationwide, we estimate that an average of about 1.2 workstations per office is needed.

Many local welfare offices have administrative terminals which could be used as EBT workstations. Some of these terminals are already being fully used, however, and converting others to EBT workstations might be technically difficult or impossible. Therefore, of the 1.2 workstations per office which

are needed, we assume that an average of 0.8 workstations per office need to be purchased and deployed. Thus, two-thirds of all EBT workstations will be newly acquired; the remaining one-third will be administrative terminals already located in local welfare offices.

At an estimated average cost of $4,000 per workstation, the amortized cost per workstation is $76.99 per month using a five-year amortization period and a five-percent cost of capital. Monthly maintenance costs are $34.76, including a 10-percent indirect cost factor. Total monthly costs per new workstation are $111.75.

With an average of 0.8 new workstations per office, total monthly workstation costs are $89.40 per office, $6,100 per State Agency, and $321,100 nationwide.

Because the information to be transmitted from each workstation is

Other Administrative Duties

In addition to card issuance, training, and hotline support, local office personnel will have other administrative duties related to the EBT system. For instance, recipients may call their caseworkers rather than the hotline for assistance. Clerks will need to schedule training appointments and handle associated paperwork. Supervisors will need to manage all EBT-related activities and fill in when staff are absent. Based on time study data from the Reading EBT demonstration, we estimate that--for an average size office--approximately 15.6 hours of clerk time will be needed each month. Caseworker time will average 16.3 hours per month, and supervisors will need to spend about 3.6 hours per month on EBT-related activities. Total labor costs per office for these positions are $605. On a Statewide basis, total labor costs to perform these administrative duties are $41,000. For all 53 State Agencies, estimated total labor costs are $2,174,500.

Summary of Local Office Operating Costs

Exhibit 8-12 summarizes local office labor costs for client training, card issuance, staffing the recipient hotline, and performing other administrative functions. If recipients select their own PINs, the estimated total average cost for all four functions is $1,615 per office, $109,500 per State Agency, and $5,802,000 for all 53 State Agencies. If PINs are assigned, total nationwide costs fall to $5,032,800.

Total local office costs (including labor, materials, hardware and telecommunications) are summarized in Exhibit 8-13. With PIN selection, average total costs per office are $2,680 per month. On a Statewide basis, average monthly local office costs for EBT-related activities are $181,600. Nationwide, these administrative costs are about $9.6 million per month. With PIN assignment, nationwide costs are about $8.6 million per month.

SYSTEM VENDORS

A number of different commercial organizations will be supplying services to Federal and State Agencies in a nationwide EBT system. The major organizations will be those companies which have developed the EBT systems; we refer to these companies as the system operators. Other organizations include

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Exhibit 8-12

AVERAGE MONTHLY LOCAL OFFICE LABOR COSTS: ALL APPROACHES

	Per Office	Per State Agency	Nationwide
Client Training			
Lead trainer (hours)[a]	13.5	918	48,641
Assistant (hours)[a]	13.5	918	48,641
Total labor cost	$536	$36,300	$1,924,400
Card Issuance			
Clerk (hours)[a]	13.5	918	48,641
Total labor cost[b]	$214	$14,500	$769,200
Recipient Hotline			
Caseworker (hours)	15.2	1,027	54,448
Total labor cost	$260	$17,600	$933,900
Other Labor			
Clerk (hours)	15.6	1,060	56,158
Caseworker (hours)	16.3	1,108	58,711
Supervisor (hours)	3.6	241	12,763
Total labor cost	$605	$41,000	$2,174,500
Total Labor Costs with PIN Selection	$1,615	$109,500	$5,802,000
Total Labor Costs with PIN Assignment	$1,401	$95,000	$5,032,800

Notes: [a]Total estimated time per session is 1.25 hours, which includes 15 minutes for staff to move to and from the training room.

[b]Labor costs are zero if PINs are pre-assigned.

Totals may not sum due to rounding.

Exhibit 8-13

AVERAGE MONTHLY LOCAL OFFICE OPERATING COSTS: ALL APPROACHES

	Per Office	Per State Agency	Nationwide
Client Training			
Labor	$536	$36,300	$1,924,400
Materials	60	4,100	214,700
Hardware	151	10,300	544,000
Total cost	$747	$50,600	$2,683,200
Card Issuance with PIN Selection			
Labor	$214	$14,500	$769,200
Card stock	102	6,900	365,100
Hardware	78	5,300	281,000
Total cost	$394	$26,700	$1,415,200
Card Issuance with PIN Assignment			
Card stock	$102	$6,900	$365,100
Recipient Hotline			
Labor	$260	$17,600	$933,900
Hardware	123	8,300	441,600
Telecommunications	550	37,300	1,975,600
Total cost	$933	$63,200	$3,351,100
Other Administrative Duties			
Labor	$605	$41,000	$2,174,500
Total Local Office Costs with PIN selection	$2,680	$181,600	$9,624,000
Total Local Office Costs with PIN Assignment	$2,387	$161,800	$8,573,900

Note: Totals may not sum due to rounding.

POS and ATM networks, transaction acquirers, and other financial institutions. Finally, State Agencies are likely to contract with commercial organizations for hardware maintenance and service, but the chapter has incorporated these costs with each discussion of hardware-related costs.

This section divides vendor costs into five subsections: terminal costs, transaction-based fees, account-based fees, hotline services for retailers, and settlement costs.

Terminal Costs

Costs related to POS terminals include amortization and maintenance costs, terminal deployment in stores newly authorized to participate in the Food Stamp Program, the cost of removing terminals from stores which leave the Food Stamp Program, and retailer training.

Amortization and Maintenance Costs. As noted in Section 8.2, we estimate that system vendors will need to deploy 527,200 POS terminals in a nationwide EBT system. This assumes terminal placement in every lane, an average of 2.6 checkout lanes in program-authorized stores, and that an additional 50,000 terminals will be deployed by the commercial sector. Another 26,360 terminals need to be purchased to provide a five-percent inventory for replacements. Future studies may indicate that terminals do not need to be deployed in every lane to maintain client service, and the impact of reduced lane coverage is considered at the end of this chapter.

Although the POS industry typically uses three years as an amortization period for terminals, we have taken a more liberal view. We assume that terminals will average five years of service before needing replacement. Several factors enter into this assessment. First, terminals in the Reading EBT demonstration already have been in service for over five years without a major replacement or upgrade effort. Second, while commercial POS networks may upgrade terminals in order to obtain newer terminals with greater functionality, we believe the Federal goverment will take a more conservative approach, replacing terminals only as they wear out. Third, terminals which malfunction in the first year of operations will often be replaced under the manufacturer's warranty. Thus, the failure of poorly manufactured terminals does not affect our estimate of average useful terminal life.

With an average purchase price of $600, monthly amortization costs for each deployed terminal are $11.55, with a five-year amortization period and a five-percent cost of capital. Estimated monthly service costs are $11.00 per terminal. Total monthly costs for the 527,200 deployed terminals are about $11,888,360. An additional $304,500 per month is needed to amortize the five-percent inventory (which would not incur monthly maintenance fees). Thus, total estimated monthly costs for all terminals are $12,192,100, or an average of about $230,000 per State Agency.

Terminal Installation. The number of program-authorized stores is never static. As new stores are built, they may seek program authorization. Existing stores may go out of business, become disqualified for further program participation, or simply decide that they no longer wish to participate in the Food Stamp Program. While we assume that the total number of program-authorized stores remains fairly constant, terminals have to be installed in new stores.

We estimate that, each month, the number of stores entering the Food Stamp Program will equal one percent of the existing base of participating stores.[1] With approximately 222,000 existing stores, terminals will need to be deployed in about 2,220 stores each month. With an estimate of 2.6 terminals needed, on average, per store, about 5,772 terminals need to be installed each month. However, with our assumption that 50,000 commercial terminals will be deployed nationwide (or 8.7 percent of the total number of terminals), we assume that 500 of these new terminals will go in stores electing to deploy commercial terminals. Thus, system vendors will need to deploy only about 5,272 EBT terminals each month. At an average installation cost of $300 per terminal, total estimated installation costs are $1,581,600 per month. No allowance is made for the purchase of these terminals because we assume the terminal deployer will use terminals removed from stores leaving the program.

Terminal Removal. Less labor will be required to remove terminals from stores leaving the program than to install terminals. With average installation labor costs estimated at $50 per terminal, we use $20 per

[1]The one-percent rate reflects experience in the Reading EBT demonstration.

terminal as an average labor cost for removal. Because we have assumed a relatively constant number of program-authorized retailers, the number of terminals to be removed each month equals the number being installed, or 5,272. Nationwide, estimated labor costs for removing terminals are $105,400.

Retailer Training. We assume that the vendor installing terminals will spend an average of three hours (including travel time) at each store training managers and clerks. Estimated training costs are $130,500 per month nationwide. Adding $0.50 per terminal for training materials (e.g., a terminal user's guide) brings total costs to $133,100 per month.

Summary of Terminal Costs. Adding all four components of terminal costs together yields an estimate of $14,012,200 per month, or an average of $264,400 per State Agency.

Transaction-Based Fees

Our interviews with representatives of the POS industry indicate that system operators of an EBT system would most likely prefer a combination of transaction-based and account-based fees to pay for the transaction authorization services they provide. Even if State Agencies or FNS and FSA negotiated different payment terms (e.g., a flat rate per case month), system operators would probably use expected counts of transactions and account records to calculate their costs before negotiating payment terms. This section describes the expected costs that vary by transaction counts.

Some of the transaction-based costs described in this section may not be incurred directly by system operators. Examples are payments to transaction acquirers, ATM networks and network switches. System operators could collect fees to cover these costs, or Federal and State Agencies could pay the individual service providers directly. Because many of these types of fees are often paid during system settlement, it may make more sense for system operators to pay the fees out of charges imposed on State and Federal Agencies. Thus, we consider all transaction-based fees in this section, regardless of which organization ultimately gets paid. To the extent that multiple services are provided by the same organization, total costs would likely decline due to the increased value of the basic contract.

Transaction Counts. Before discussing transaction-based fees in a nationwide EBT system, the number of expected transactions needs to be estimated. Based on the experience of the Reading and Ramsey County demonstrations, we estimate that food stamp recipients will average 8.0 transactions per month at POS terminals. AFDC recipients will average 4.0 transactions per month, some at ATMs and some at POS terminals. We assume that the AFDC transactions will be split evenly between ATMs and POS terminals, although no empirical evidence exists to support this assumption.[1]

The average number of transactions each recipient makes at POS terminals and ATMs can have a major impact on monthly system operating costs. While our cost estimates are based on the above expected usage patterns, the cost impacts of greater system usage are explored at the end of the chapter.

With over 7 million food stamp households, the number of expected food stamp transactions at POS terminals is about 56.4 million per month. The number of AFDC households is over 3.7 million; these households are expected to generate over 7.5 million POS transactions each month and an equal number of ATM transactions. The total number of expected POS transactions, therefore, is about 64.0 million per month.[2]

Transaction costs will vary depending upon whether the transaction originates at a commercially deployed POS terminal or an EBT system deployed terminal, so we need to estimate the number of POS transactions originating at commercial terminals. Nationwide, the expected average number of EBT transactions per POS terminal is about 111 per month.[3] Because commercial terminals

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[1]In Ramsey County, approximately 75 percent of AFDC transactions are originating at ATMs. Because there are currently very few POS terminals in the Ramsey County demonstration, we do not believe this percentage is indicative of the relative use of ATMs and POS terminals by AFDC clients in a fully deployed EBT system.

[2]In Chapter 2, we estimated that an EBT system would handle approximately 100 million transactions a month. This estimate, however, included administrative transactions and issuance transactions, which are not counted in calculating fees. Industry representatives indicated that system operators probably would not charge for these transactions separately (i.e., regular transaction fees would cover the costs of processing these transactions).

[3]Calculated by dividing 63,980,184 transactions by 577,200 terminals.

are likely to be deployed at stores which are larger and busier than the average program-authorized store, we assume that these terminals will handle twice the national average, or about 222 EBT transactions per month. With 50,000 commercial terminals, the estimated number of transactions originating at commercial terminals is about 11 million, leaving 53 million transactions originating at system-deployed terminals (or an average of 100 transactions per terminal per month).

Transaction Processing Steps. Before presenting estimates of transaction-based fees, one needs to understand the steps involved in processing a commercial POS transaction and the organizations providing services. As summarized in Exhibit 8-14, the process begins at the retailer's store. The retailer either owns the POS terminal or leases it from the terminal deployer. The terminal builds the transaction request message and sends it to the transaction acquirer (which is often the financial institution which deployed the terminal). The retailer incurs telecommunications costs as the transaction messages are sent and received. Depending upon the negotiated contract between the retailer and transaction acquirer, either may be responsible for paying these costs.

The transaction acquirer receives the message, verifies that the transaction originated at an authorized terminal, and sends the transaction message on to either a network switch or the card issuer (i.e., the organization which issued the debit card used to initiate the transaction). The transaction acquirer relays the authorization response from the switch (or card issuer) back to the terminal. The acquirer also captures information on the amount of the transaction and the retailer so that, during daily settlement, the acquirer can deposit funds to the retailer's deposit account. The acquirer pays the telecommunications costs between itself and the switch or card issuer.

If transaction messages are not passed directly between acquirers and card issuers, a network switch is responsible for routing all transactions from the acquirer to the appropriate card issuers. The switch pays the telecommunications costs between itself and the card issuer. The switch also

Exhibit 8-14

TRANSACTION PROCESSING STEPS

Organization	Services Provided
Retailer	• Owns or leases terminal • Terminal builds transaction message • May pay costs of telecommunications between retailer and acquirer
Transaction Acquirer (Terminal Deployer)	• Acquires transaction (receives message) • Verifies identity of terminal and merchant • Routes transaction to switch or card issuer • Settles retailer's account • May pay costs of telecommunications between retailer and acquirer • Pays telecommunications costs to switch or card issuer
Switch	• Routes transactions from acquirers to card issuers • Settles all acquirer and card issuer accounts • Pays telecommunications costs between itself and card issuer
Card Issuer	• Issues debit cards • Authorizes transaction requests

settles all accounts at the end of the processing day, drawing funds from card issuers' accounts and depositing then into transaction acquirers' accounts.

Finally, the card issuer receives the transaction message (from either the acquirer or the switch) and processes the transaction against the cardholder's account. During this process, the card issuer verifies the customer's PIN and account status and checks the transaction dollar amount against the customer's remaining balance.

In an EBT system, the system vendor acts as card issuer. In the State-Initiated systems, the vendor may also deploy terminals, thereby becoming the transaction acquirer and eliminating the need for a network switch. This is less likely in the Regional and National approaches because of the number of terminals involved. Even in these approaches, however, the system vendor may deploy terminals in some markets.

Regardless of system approach, EBT transactions originating from commercially deployed terminals will pass through the network switch serving those terminals. The switch will route these transactions to the system vendor for authorization.

Fees to Transaction Acquirers. Based on interviews with industry representatives, transaction acquirers generally charge between $.06 and $.10 per transaction to acquire and settle transactions, so we use an average of $.08 per transaction. This fee does not cover the retailer's telecommunication costs, which we estimate to average $.10 per transaction.[1] The retailer may also incur basic monthly charges for the telephone lines used by an EBT system, which we assume will be borne by the retailer. In many cases these costs will be small or nonexistant, as when an existing line is used for EBT transactions in stores with small food stamp redemption volumes.

At a total cost of $.18 per transaction, total monthly acquisition fees for POS transactions in a nationwide EBT system will equal approximately $11.5 million (based on 64 million transactions). This same cost is incurred

[1]Telecommunications costs can range from zero to up to $.25 per transaction, depending on class of telephone service, distance to the acquiring institution, and whether dial-up or leased lines are used.

in each of the development approaches, because transactions must be acquired regardless of system design.

Acquisition fees also need to be paid for ATM transactions generated by AFDC recipients. ATM acquisition fees generally range from $.50 to $1.00 per transaction, depending on which ATM network is being used. We assume an average cost of $.60 per transaction, or $4.5 million for the estimated 7.5 million ATM transactions each month.

Fees to Retailers. Retailers presently incur coupon-handling costs to participate in the Food Stamp Program (i.e., coupons must be sorted, counted and deposited in the retailer's bank, and Redemption Certificates must be filled out and submitted to the bank). An evaluation of the Reading EBT demonstration estimates coupon-handling costs at $19.19 per $1,000 of benefits redeemed.[1] These costs will be eliminated in an EBT system.

Retailers will incur other costs in an EBT system, as described in this section. These costs generally will be lower than coupon-related costs, and it is likely that retailers may need to absorb some of the EBT system costs if a nationwide EBT system is to be economically feasible. This can be done while still reducing retailers' overall costs to participate in the Food Stamp Program.

For commercial terminals, the retailer will either own the store's POS terminals or lease then from the transaction acquirer. Thus, even if State or Federal Agencies pay all the EBT transaction acquisition fees charged by the acquirer, the retailer may expect payment for an EBT system's use of the commercial terminals he owns or leases. Although it is difficult to predict the final outcome of negotiations between retailers and the EBT system operator, we have allocated $.03 per transaction to cover retailer costs. With our assumption that commercial terminals will handle, on average, 222 EBT transactions per month, the retailer would collect $6.66 in EBT fees per terminal each month, or about 30 percent of the terminal's estimated monthly amortization and maintenance costs.

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[1] John A. Kirlin et al., The Impacts of the State-Operated Electronic Benefit Transfer System in Reading, Pennsylvania, Cambridge, Massachusetts: Abt Associates Inc., February 1990, pp. 186-191.

With an estimated 11 million EBT transactions being generated each month at commercially deployed terminals, this fee represents a cost of about $332,500 per month.

Another cost which retailers would incur is the $.10 per transaction telecommunications charge (which has already been included as part of the $.18 per transaction acquisition charge). For stores with commercially deployed terminals, this cost equals an average of $22.20 per terminal per month. For all other stores, the average cost is $10.00 per terminal per month. These figures are based on estimated average monthly transaction counts of 222 and 100, respectively, at commercial and EBT terminals.

We noted earlier that retailers' EBT costs generally would be less than coupon-handling costs. In Reading, the average food stamp purchase amount across all stores was about $16.44 per transaction, so 61 transactions generated about $1,000 in redeemed benefits. At a cost of $19.19 per $1,000 of redeemed benefits, the average coupon-related cost per transaction was $.31. The EBT costs noted above average between $.10 and $.13 per transaction. While this comparison does not include all retailer costs related to either system (e.g., training costs or the costs of basic phone service), it does indicate the relative magnitude of coupon-related costs which will be eliminated with the introduction of an EBT system. Consequently the assumptions for cost-sharing with retailers, as well as other vendors, are re-examined later in this chapter.

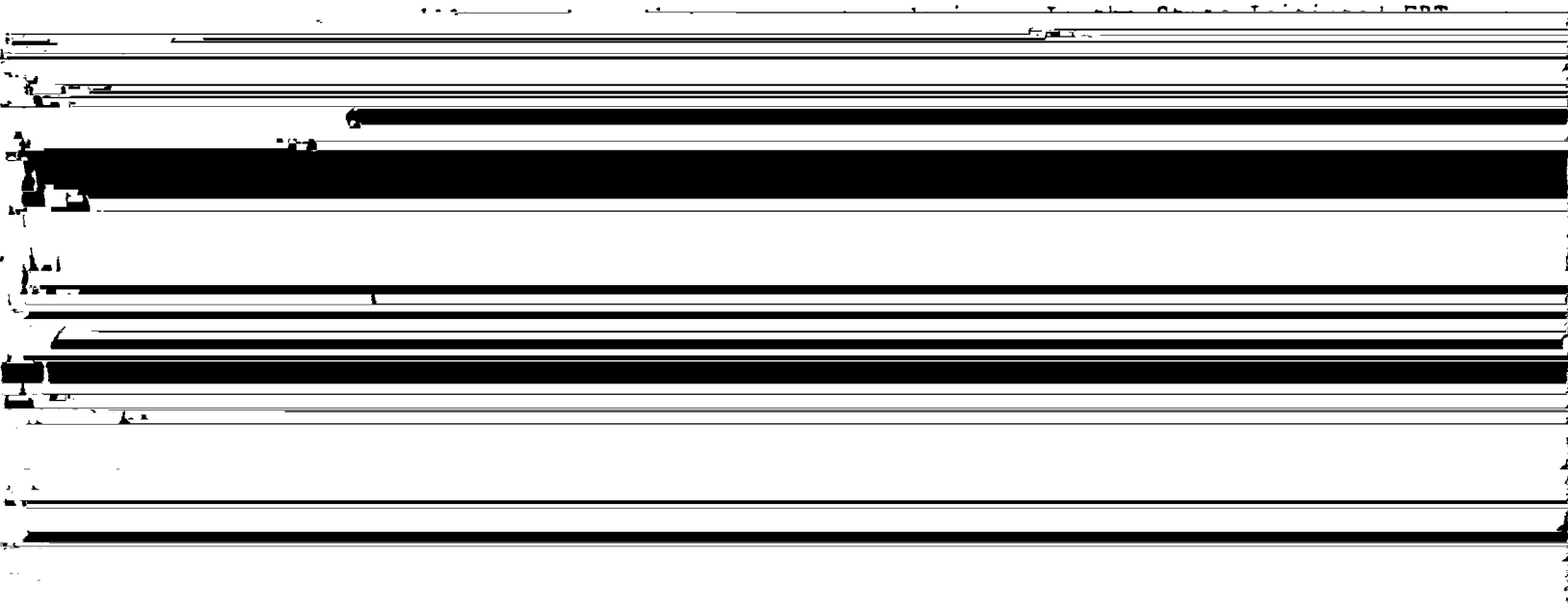
Fees to Network Switches. Estimated fees for each POS and ATM transaction passing through a network switch are $.05 per transaction. In the Regional and National EBT systems, we assume that all ATM transactions and 80 percent of all POS transactions will pass through a switch, which will then route the transactions on to the EBT system operator(s). The operator will acquire 20 percent of the POS transaction itself. With 64.0 million POS transactions and 7.5 million ATM transactions, total switch fees will equal $2.9 million each month.

In the State-Initiated systems, we assume that only those transactions originating at commercial terminals or ATMs will pass through a switch. As system terminals are deployed, agreements can be reached with terminal deployers (transaction acquirers) to route EBT transactions directly to the system operator. With an estimated 11 million POS transactions originating at

commercial terminals, total switch fees for POS transactions in the State-Initiated systems equal $554,200. Switch fees for ATM transactions will equal $377,100, bringing total switch fees in this design to $931,300 per month.

Fees to System Operators. The system operator will process each POS and ATM transaction against the EBT system's recipient database, authorizing or rejecting transactions depending on the recipients' remaining balances.

The number of EBT transactions processed by individual system



systems, monthly transaction volume for an average-sized State will equal 1.3 million transactions. If seven regional vendors are used in the Regional system, average monthly transaction volume per vendor is 10.2 million transactions. In a National EBT system, one vendor would process all 71.5 million transactions.[1]

System operators' unit costs to process POS and ATM transactions will vary depending upon monthly volume. Generally, one would expect per-transaction fees to decline as volume increases. In the State-Initiated EBT systems, we estimate processing fees at $.06 per transaction. This fee drops to $.04 per transaction in the Regional systems. In the National system, however, we use $.05 per transaction as the estimated fee required by the system operator. This increase in unit cost (relative to the Regional system) reflects the greater processing costs expected to occur in a very large and complex data processing system.[2]

With this fee structure, estimated monthly fees for transaction processing are $4.3 million in the State-Initiated systems, $2.9 million in the Regional systems, and $3.6 million in the National system.

Summary of Transaction-Based Fees. Exhibit 8-15 summarizes monthly

Exhibit 8-15

SUMMARY OF TRANSACTION-BASED FEES
(Millions of Dollars)

	State-Initiated	Regional	National
Transaction Acquisition			
POS trx ($.18 per trx)	$11.52	$11.52	$11.52
ATM trx ($.60 per trx)	$4.53	$4.53	$4.53
Retailer Fees			
Commercial terminals ($.03 per trx)	$.33	$.33	$.33
Network Switches			
POS trx ($.05 per trx)	$.55	$2.56	$2.56
ATM trx ($.05 per trx)	$.38	$.38	$.38
System Operators			
POS trx ($.04-$.06 per trx)	$3.85	$2.57	$3.21
ATM trx ($.04-$.06 per trx)	$.45	$.30	$.38
Total Fees			
POS trx ($.22-$.32 per trx)	$16.25	$16.98	$17.62
ATM trx ($.69-$.71 per trx)	$5.35	$5.20	$5.28

Note: Totals may not sum due to rounding.

Initiated systems because, even though processing fees are $.01 to $.02 higher per transaction than in the other systems, fewer transactions pass through a network switch. The total cost per transaction ranges from $.24 to $.32 in the State-Initiated systems. In the Regional and National systems, total costs per transaction range from $.22 to $.32.

Total monthly fees for ATM transactions vary from $5.2 million in the Regional system to $5.4 million in the State-Initiated systems. The total cost per transaction is $.71 in the State-Initiated systems, $.69 in the Regional system, and $.70 in the National system.

Account-Based Fees

The system operator will incur the costs of maintaining and updating the EBT system's recipient database. Fees to cover these costs may be separately charged, or they may be included as part of a negotiated package fee structure (e.g., a flat fee per case month or a fee per transaction that covers all costs).

We estimate that, nationwide, approximately 11.6 million records will need to be maintained on the EBT database. This includes 10.8 million records for active food stamp and AFDC households and another 0.8 million records (7.5 percent of the active records) for previously active households who still have benefits left in their accounts.[1]

As with transaction processing, system operators' unit costs for maintaining account records are expected to vary by the size of the database. For the State-Initiated systems (where the average database size will equal

[1]When the AFDC and food stamp household includes the same family members (or the same head of case), system operators may use a single record for the EBT account. Industry representatives, however, suggested that system operators might charge separately for the AFDC and food stamp portions of the account. Thus, we use 10.8 million records rather than 7.8 million records, which is the unduplicated active case count.

The allowance for inactive accounts assumes that 5 percent of the caseload leaves the system each month and that an inactive account is maintained for 90 days if it still carries a positive remaining balance. We assume that one-half of the inactive accounts carry a positive balance, yielding a 7.5-percent allowance (i.e., 3 months times 5 percent times 50 percent).

about 219,600 records), estimated fees are $.04 per account, or $465,500 per month for all 53 State Agencies. In the Regional system, estimated unit costs are $.02 per account, or $232,800 per month nationwide. Finally, in the National system, we again believe there are diseconomies of scale; the estimated unit cost is $.03 per account, or $349,100 per month.

Hotline Services for Retailers

In a nationwide EBT system, retailers will have to call vendors to report malfunctioning equipment, to enquire whether a questionable transaction was indeed processed correctly, or to request manual authorizations when their equipment or the system is not operating. The same vendor may not be responsible for handling all calls. That is, while the system operator will have to respond to requests for manual authorizations and inquiries about individual transactions, the transaction acquirer will probably be responsible for arranging service visits for equipment. In this section we estimate the total costs of providing hotline services, regardless of which vendors may incur these costs. As with account-based costs, a system operator's costs for hotline services might be included in a negotiated package fee rather than separately charged.

Manual Authorizations. Based on experience in Reading, we estimate that 0.3 percent of all POS transactions will need manual authorization. The base includes both food stamp and AFDC purchases at POS terminals, so an estimated 191,900 transactions will need manual authorization each month nationwide. We further estimate that manual authorizations will require five minutes of an operator's time to complete the call, enter the transaction data on the system's database, and wait for the next call. With a 35-hour workweek about 106 hotline staff are needed, generating $295,500 in monthly labor costs.

Using a toll-free 800 number, we estimate that the average cost per call will be $.75 in the State-Initiated systems, $1.00 in the Regional systems, and $1.25 in the National system. The increased costs arise from longer distances for calls in the Regional and National systems. Total estimated telecommunications costs, therefore, are $144,000 in the State-Initiated systems, $191,900 in the Regional systems, and $239,900 in the National system.

Adding labor and telecommunications costs, total monthly costs for providing manual authorizations are $439,500 in the State-Initiated systems, $487,500 in the Regional systems, and $535,400 in the National system. With an estimated 191,900 manual authorizations per month, average costs per authorization range from $2.29 to $2.79. If one views these costs as transaction "acquisition" costs and compares them to the $0.18 per transaction acquisition costs for electronically acquired transactions, the high cost of manually authorized transactions is apparent.

Other Hotline Services. In Reading, the average number of retailer calls to the hotline each month (excluding calls for manual authorizations) is about 50 percent of the number of retailers participating in the system. Applying this rate to the 222,000 retailers nationwide, one would expect about 111,000 calls per month.

As in the Reading EBT demonstration, most retailer calls are likely to concern equipment problems, so these calls will be placed to the terminal deployer or maintenance contractor. The cost of responding to these calls is assumed to be covered in the deployer's or service provider's existing contract fee structure. Thus, no additional costs are allocated for this function.

Settlement Costs

System operators will settle the EBT system at the end of each processing day. Although industry representatives said that the operators' costs of settlement processing would be covered through account-based or transaction-based fees, system operators will have to pay the systems' clearinghouse banks for settlement data passed through the Federal Reserve's Automated Clearinghouse (ACH) network. We have allocated $.05 per item to cover ACH fees.

An ACH "item" is a record instructing the Federal Reserve to debit funds from an account and to credit these funds to a retailer's account. The Federal Reserve, of course, does not actually credit a retailer's account. Instead, it passes the credit information to the appropriate transaction acquirer.

Based on data from the Reading demonstration, about 90 percent of all retailers will process some EBT transactions each day. Thus, we estimate that 199,800 settlement items will be passed to the ACH each banking day. The average number of banking days per month is 21.5, so about 4.3 million items will be generated each month. At $0.05 per item, ACH costs during settlement will equal about $214,800 per month.

It is possible that some system operators could act as a clearing-house institution themselves, bypassing the Federal Reserve's ACH network. Most POS networks use the ACH, however, and significant savings might be realized only if the system operator used a financial institution which already held most retailer accounts. This is possible in local markets, but unlikely in any Statewide implementation. We therefore do not anticipate any significant savings in settlement costs from this approach.

Summary of System Vendor Costs and Possible Cost Reductions

Estimated monthly costs incurred by vendors in a nationwide EBT system are summarized in Exhibit 8-16. Total vendor costs are about $36.7 million in the State-Initiated systems, $37.1 million in the Regional systems, and $38.0 million in the National system.

Vendor costs are by far the largest component of an EBT system's monthly operating costs, and the estimated costs presented in Exhibit 8-16 could well make an EBT system too expensive to operate as an alternate issuance system in the Food Stamp or AFDC programs. The question therefore arises as to whether vendor costs could be reduced. As explained below, several factors could act to reduce costs.

First, the cost estimates presented in Exhibit 8-16 are based on today's prices. Terminal prices and industry processing fees have declined in recent years, and they could decline further over the next several years. This is especially true for transaction-based fees as transaction volumes and processing efficiencies increase.

Second, most of the estimated vendor costs are averages of existing price structures. An example is transaction acquisition fees. While these fees typically range from $.06 to $.10 a transaction, we have used an estimate of $.08 a transaction. In selecting terminal deployers, system vendors or

Exhibit 8-16

SUMMARY OF SYSTEM VENDOR COSTS
(Millions of Dollars)

	State-Initiated	Regional	National
Terminal Costs			
Amortization and maintenance	$12.19	$12.19	$12.19
Installation	$1.58	$1.58	$1.58
Removal	$.11	$.11	$.11
Retailer training	$.13	$.13	$.13
Total	$14.01	$14.01	$14.01
Transaction-Based Fees			
POS transactions	$16.25	$16.98	$17.62
ATM transactions	$5.35	$5.20	$5.28
Total	$21.61	$22.18	$22.90
Account-Based Fees	$.47	$.23	$.35
Manual Authorizations	$.44	$.49	$.54
Settlement Costs	$.21	$.21	$.21
Total Vendor Costs	$36.74	$37.13	$38.01

Note: Totals may not sum due to rounding.

Federal or State Agencies might be able to negotiate costs at the lower end of the industry range. The same is true for other cost components.

Third, our approach to estimating costs has been to identify each task or service to be performed by vendors and to cost these services separately. The cost estimates have not considered any possible economies which might occur if a single vendor were providing multiple services. For instance, if a system vendor acquires or switches transactions as well as authorizing them, total fees might be less than the sum of the component cost estimates. Other services which would definitely be provided by the system operator are account maintenance and authorization of manual transactions.

Finally, the cost estimates include fees paid to retailers for telecommunications costs and use of commercially deployed terminals. Implementation of an EBT system, however, will reduce retailers' present costs of handling food stamp coupons. It is likely that these fees could be reduced or eliminated without increasing retailers' costs to participate in the Food Stamp Program.

Taking these factors into consideration, by how much might the estimated costs in Exhibit 8-16 be reduced? With the following changes in individual cost assumptions, total vendor costs could be reduced by $7 to $8 million per month, as shown in Exhibit 8-17:

- average terminal purchase cost reduced from $600 to $550,
- average POS acquisition fees reduced from $.08 per transaction to $.06,
- average ATM acquisition fees reduced from $.60 per transaction to $.50,
- average switch fees reduced from $.05 per transaction to $.035,
- average POS and ATM authorization fees reduced by $.01 per transaction,
- payments to retailers for use of commercial terminals eliminated,
- payments to retailers for telecommunications costs reduced from $.10 per transaction to $.05,
- account maintenance fees reduced by half, and
- manual authorization costs reduced by 10 percent.

Exhibit 8-17

SUMMARY OF REDUCED SYSTEM VENDOR COSTS
(Millions of Dollars)

	State-Initiated	Regional	National
Terminal Costs			
Amortization and maintenance	$11.66	$11.66	$11.66
Installation	$1.58	$1.58	$1.58
Removal	$.11	$.11	$.11
Retailer training	$.13	$.13	$.13
Total	$13.48	$13.48	$13.48
Transaction-Based Fees			
POS transactions	$10.63	$10.75	$11.40
ATM transactions	$4.41	$4.26	$4.34
Total	$15.05	$15.02	$15.73
Account-Based Fees	$.23	$.12	$.17
Manual Authorizations	$.40	$.44	$.48
Settlement Costs	$.21	$.21	$.21
Total Vendor Costs	$29.37	$29.27	$30.08

Note: Totals may not sum due to rounding.

Any one of these new cost assumptions is defensible, given the factors noted above. Whether it is possible that all could occur is difficult to ascertain. Nevertheless, these assumptions provide cost estimates which form a reasonable lower bound for total vendor costs.

OVERALL SUMMARY OF SYSTEM OPERATING COSTS

Exhibit 8-18 combines all cost factors and presents the total estimated costs to operate a nationwide EBT system each month. High and low cost estimates are given at the bottom of the table. The high estimate uses the vendor costs presented in Exhibit 8-16 and assumes selection of PINs by recipients during training. The low estimate assumes the less costly PIN assignment approach and uses the reduced vendor cost estimates presented in Exhibit 8-17.

For the high estimate, total monthly costs to operate a nationwide EBT system vary from $51.6 million to $52.5 million, depending on development approach. The low estimates are $8 to $9 million lower, varying from $42.8 million to $43.6 million.

The estimated monthly operating costs will be allocated between the Food Stamp and AFDC programs. Furthermore, each program's costs will be shared by State Agencies and the respective Federal Agencies, FNS and FSA. Exhibit 8-19 shows the allocation of total monthly operating costs by program and agency. Total Food Stamp Program costs range from about $31.8 million to $39.3 million per month. AFDC costs vary from $10.9 million to $13.3 million per month.

In dividing total monthly operating costs into those related to the Food Stamp and AFDC programs, some costs could be unambiguously allocated to the individual programs. Examples of such costs are those incurred by FNS and FSA and ATM acquisition and processing fees. Other costs are allocated on the basis of the relative size of the food stamp and AFDC caseloads. These costs include State Agency labor, benefit issuance, card issuance, recipient training, and account maintenance fees. Finally, some costs are allocated in proportion to the POS transactions initiated by food stamp and AFDC recipients. These costs cover terminal amortization and maintenance, retailer training, manual transactions, and POS transaction acquisition and processing. Appendix C provides greater detail on the allocation of system operating costs between programs.

Exhibit 8-18

TOTAL MONTHLY SYSTEM OPERATING COSTS

	State-Initiated	Regional	National
FNS	$973,500	$962,900	$953,300
FSA	$30,000	$24,300	$21,000
State Agencies	$4,231,700	$3,924,900	$3,930,700
Local Offices			
With PIN Selection	$9,624,000	$9,624,000	$9,624,000
With PIN Assignment	$8,573,900	$8,573,900	$8,573,900
Vendors			
Low Estimate	$29,369,000	$29,265,000	$30,083,600
High Estimate	$36,740,400	$37,126,300	$38,007,800
Total Monthly Costs			
Low Estimate[a]	$43,178,100	$42,750,900	$43,562,500
High Estimate[b]	$51,599,600	$51,662,300	$52,536,900

Note: [a]Low estimate uses lower vendor cost estimate and assumes assignment of PINs.

[b]High estimate high base vendor cost estimate and assumes PIN selection by clients.

All cost estimates based on 7,054,773 food stamp cases and 3,771,000 AFDC cases.

Totals may not sum due to rounding.

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Exhibit 8-19

ALLOCATION OF TOTAL MONTHLY COSTS BY PROGRAM AND AGENCY (Millions of Dollars)

	State-Initiated	Regional	National
Food Stamp Program			
FNS share	$16.5 - $19.7	$16.4 - $19.8	$16.7 - $20.1
State Agency share	$15.5 - $18.7	$15.4 - $18.8	$15.7 - $19.2
Total	$32.0 - $38.3	$31.8 - $38.6	$32.4 - $39.3
AFDC Program			
FSA share	$5.6 - $6.6	$5.5 - $6.5	$5.6 - $6.6
State Agency share	$5.6 - $6.6	$5.5 - $6.5	$5.5 - $6.6
Total	$11.2 - $13.3	$10.9 - $13.0	$11.1 - $13.2
State Agency Total	$21.1 - $25.3	$20.9 - $25.3	$21.3 - $25.8

Note: Ranges reflect low and high cost estimates.

Total monthly costs in each program are allocated between the State Agencies and the respective Federal Agencies. If FNS is responsible for all of its direct administrative costs and 50 percent of all other program costs, its total administrative costs vary from about $16.4 to $20.1 million per month, or from $197 to $241 million annually. State Agencies' share of program costs are slightly lower. Using the same allocation procedure for the AFDC program, FSA's and State Agencies' costs are both in the range of $5.5 to $6.6 million per month. State Agencies' share of costs for both programs run from $20.9 to about $25.8 million per month.

Total issuance and redemption costs in the Food Stamp Program currently average about $3.00 per case month, varying generally from $1.19 to $6.70 per case month across State Agencies.[1] The total program costs in Exhibit 8-19 lead to the following estimated costs per case month for a nationwide EBT system:

COSTS PER CASE MONTH

	State-Initiated	Regional	National
Food Stamp	$4.53 - $5.43	$4.51 - $5.48	$4.60 - $5.57
AFDC	$2.97 - $3.52	$2.90 - $3.46	$2.95 - $3.51

These costs are higher than for the paper-based coupon system.

In assessing the overall feasibility of an EBT system, one must keep in mind more than just the system's likely impacts on program administrative costs. An EBT system can reduce recipients', retailers' and financial institutions' costs to participate in the Food Stamp Program. Furthermore, it can substantially reduce levels of benefit diversion. Based on an evaluation of the Reading EBT demonstration, estimated levels of net benefit diversion in an ATP/coupon issuance system are $3.11 per case month.[2] Examples of benefit diversion include use of food stamp benefits to purchase ineligible items;

[1] Appendix D presents the basis for the estimate of $3.00 per case month.

[2] John A. Kirlin et al., The Impact of the State-Operated Electronic Benefit Transfer System in Reading, Pennsylvania, Cambridge, Massachusetts: Abt Associates Inc., February 1990.

selling coupons for cash (trafficking), and using cash change from food stamp purchases to buy non-food items. The first two examples violate program regulations.

In contrast, estimated levels of net benefit diversion in an EBT system are only $.66 per case month, representing a reduction in benefit diversion of $2.45 per case month. While this 79-percent reduction does not lower program costs, it reduces the incidence and magnitude of program violations and better targets program benefits toward their intended purpose--raising levels of nutrition among low-income households. By reducing benefit diversions, an EBT system can also improve the public's perception of the Food Stamp Program.

Having an EBT system serve both the Food Stamp and AFDC Programs is expected to lower costs in each program through cost sharing. Training costs for PA food stamp cases, for instance, would be spread over both programs. Surprisingly, Food Stamp Program costs are only about $0.41 to $0.48 per case month lower in a multiprogram EBT system than in a single program system, a decrease of less than 10 percent. The lower-than-anticipated decrease in costs arises because most vendor costs (the biggest component of total costs) do not involve sharing between programs. All transaction- and account-based fees, for example, are already assigned to one program or another (not shared and allocated across programs) in the original cost estimates. In the one major exception--terminal costs--only 12 percent of total costs were allocated to the AFDC program, reflecting the two programs' expected relative use of the terminals.

With a relatively small savings attributable to a multiprogram system, is it worthwhile to implement such a system? Probably so. A $0.45 per case month savings for the Food Stamp Program translates into $3.2 million per month, or $38.1 million annually. In addition, a multiprogram system helps integrate more fully the issuance of government assistance benefits. Unless there are serious impediments to implementing a multiprogram system (compared to a Food Stamp Program-only system), there is little reason not to implement one, even if savings are lower than anticipated.

SENSITIVITY OF COST ESTIMATES

The chapter has already examined the sensitivity of the cost estimates to changes in some cost assumptions, especially those related to vendor costs. This final section presents how estimated costs per case month are impacted as other assumptions are changed. The results are displayed in Exhibit 8-20, which uses the low estimates of total costs as the basis for comparison, followed by the impact of a Food Stamp Program-only system.

The cost estimates assume that food stamp recipients will average 8.0 EBT transactions per month. If average usage is 10.0 transactions per month instead, per-case-month costs increase by about $.42. Of interest is the $.12 drop in AFDC costs per case month, which occurs because the Food Stamp Program will bear a greater proportion of terminal-related costs due to greater usage.

The exhibit next shows the impact of letting recipients select their own PINs rather than receiving pre-assigned PINs. The impact is only about $.10 per case month in the Food Stamp Program and $.08 per AFDC case month. Given the potential problems which recipients might have with pre-assigned PIN (plus the additional security required over cards before their distribution), it may be better to allow recipient selection of PINs. As noted in Section 8.2, however, the PIN selection approach also adds about $13.1 million to initial implementation costs.

The cost estimates assume that retailers will be reimbursed an average of $.05 per EBT transaction initiated at their terminals to defray telecommunications costs. If no reimbursement is provided (based on retailers' expected savings from not having to handle food stamp coupons), monthly costs drop by $.40 per food stamp household and $.10 per AFDC household.

The rest of the sensitivity analysis deals with assumptions regarding the number of POS terminals to be deployed in an EBT system. The analysis examines the effects of changes in the number of commercial terminals assumed to be deployed, the average number of lanes per store, and the assumption so far that terminals would be deployed in all lanes of each program-authorized store.

Exhibit 8-20

IMPACT OF DIFFERENT COST ASSUMPTIONS
(Changes in Monthly Operating Costs per Case)

	State-Initiated	Regional	National
Base Cost Per Case (Low Estimate)			
Food Stamp	$4.53	$4.51	$4.60
AFDC	$2.97	$2.90	$2.95
No AFDC Cases			
Food Stamp	+ $.42	+ $.41	+ $.41
AFDC	- $2.97	- $2.90	- $2.95
FSP Recipients Average 10 vs. 8 Transactions per Month			
Food Stamp	+ $.41	+ $.41	+ $.44
AFDC	- $.12	- $.12	- $.12
PIN Selection instead of PIN Assignment			
Food Stamp	+ $.11	+ $.10	+ $.10
AFDC	+ $.08	+ $.08	+ $.08
Elimination of $.05 per Transaction Payment to Retailers			
Food Stamp	- $.40	- $.40	- $.40
AFDC	- $.10	- $.10	- $.10
75,000 vs. 50,000 Commercial POS Terminals			
Food Stamp	- $.05	- $.08	- $.08
AFDC	- $.01	- $.02	- $.02
An Average of 2.8 vs. 2.6 Terminals per Store			
Food Stamp	+ $.14	+ $.14	+ $.14
AFDC	+ $.04	+ $.04	+ $.03

Exhibit 8-20
(continued)

	State-Initiated	Regional	National
An Average of 2.4 vs. 2.6 Terminals per Store			
Food Stamp	- $.14	- $.14	- $.14
AFDC	- $.03	- $.03	- $.04
306,000 vs. 527,200 Vendor-Deployed Terminals			
Food Stamp	- $.66	- $.70	- $.70
AFDC	- $.16	- $.17	- $.18

The per-case-month cost estimates at the top of Exhibit 8-20 are based on an assumption that 50,000 terminals would be deployed by commercial networks by the time an EBT system is implemented. If 75,000 commercial terminals were deployed instead, monthly costs per food stamp household would drop $.05 to $.08. AFDC costs would remain virtually unchanged. Initial implementation costs, however, would decrease by $6.7 to $8.2 million.

For commercial networks to deploy 55,000 more terminals within the next five years (20,000 have been deployed already), the annual growth rate in deployed terminals would need to be a little over 30 percent. This is high given recent trends. The industry does predict at 43-percent increase across all stores within the next year, however, so a 30-percent annual growth rate may be possible.

There is another factor which affects the number of terminals to be deployed in an EBT system. Based on data from the EBT demonstration sites, we have assumed that program-authorized stores will need terminals in an average of 2.6 checkout lanes. We have no way of determining the representativeness of the demonstration sites. If the nationwide average is 2.8 lanes per store, food stamp costs increase by about $.14 per case month and AFDC costs increase by $.04 per case month. If the actual average is only 2.4 lanes per store, operating costs decrease by about $.14 and $.03 per case month in the two programs, respectively.

All of the cost estimates to this point have assumed that terminals would be deployed in all lanes of all program-authorized stores. Such a deployment approach will lead to many terminals which are used fairly infrequently for EBT transactions. To illustrate, earlier in this chapter we estimated that Stage Agency-deployed terminals would average about 100 EBT transactions per month. An obvious questions is whether it makes economic sense to deploy so many terminals when each terminal will handle an average of only three to four EBT transactions a day.

FNS is currently investigating terminal deployment guidelines which are based on expected usage patterns. If a policy decision is made that--during a peak hour of EBT system operations--no more than 30 minutes should be spent processing EBT transactions at any given checkout lane, the total number of terminals needing to be deployed is about 312,000. An additional 23,000 terminals are needed (for a total of 335,000 terminals) if at least two

terminals are deployed in all multi-lane stores to provide backup if one terminal malfunctions. These estimates are based on distributions of monthly food stamp redemption volumes in program-authorized stores and data from the Reading EBT demonstration which indicate: (1) the average dollar amount and average transaction times for EBT-related purchases; and (2) the distribution of EBT transactions by day of month and time of day.

If the higher estimate of 335,000 terminals is used and commercial networks deploy 50,000 terminals, system vendors will need to deploy about 306,000 terminals instead of 527,200. The number of vendor-deployed terminals is more than 285,000 (i.e., the difference between 335,000 and 50,000) because some commercial terminals will be deployed in lanes which would not be equipped given the above deployment guidelines.

If system venders deploy 306,000 terminals instead of 527,200, monthly operating costs per case drop substantially. Food Stamp Program costs decrease by $.66 to $.70 per case month, and AFDC Program costs decrease by $.16 to $.18. In addition, initial terminal deployment costs fall by $59.7 to $73.0 million.

If all favorable cost assumptions are used, estimated monthly costs are $3.46 per food stamp case in the State-Initiated approaches, $3.36 per case in the Regional approach, and $3.45 per case in the National approach. AFDC costs range between $2.62 and $2.71 per case month. These cost estimates assume that commercial networks deploy 75,000 terminals, that system vendors deploy about 291,500 terminals (the number is smaller than 306,000 due to the increased commercial deployment), and that no reimbursement is provided to retailers for telecommunications costs.

Food Stamp Program operating costs increase to between $6.16 and $6.35 per case month if all cost-increasing assumptions are considered. Thus, these cost estimates assume that: terminals are deployed in every lane; the average number of lanes per store is 2.8 instead of 2.6; commercial networks deploy 50,000 terminals; food stamp recipients average 10 EBT transactions per month instead of 8; PINs are selected by recipients; and the higher estimates of vendor costs (presented in Exhibit 8-16) are used. With these same assumptions, AFDC costs increase to between $3.36 and $3.42 per case month.

Based on the above analysis, the range of estimated costs per case month for a nationwide EBT system is:

COSTS PER CASE MONTH

	State-Initiated	Regional	National
Food Stamp	$3.46 - $6.16	$3.36 - $6.23	$3.45 - $6.35
AFDC	$2.71 - $3.42	$2.62 - $3.36	$2.66 - $3.41

If the EBT system served only the Food Stamp Program, monthly costs could go as high as $6.59 in the State-Initiated approach, $6.65 in the Regional approach, and $6.77 in the National approach.

SUMMARY

This section has presented numerous estimates of the monthly costs to operate a nationwide EBT system, and the presented range of costs is considerable. This range points out that system operating costs will depend on a large number of factors, with terminal deployment considerations and vendors' fees to acquire and process transactions being key issues.

The economic feasibility of a nationwide EBT system will require that many cost saving decisions be made within both the private and public sectors. The lower-bound estimates of monthly operating costs, however, do approach the costs of the current coupon-based system. When consideration is given to an EBT system's potential to reduce benefit diversion and recipients', retailers' and financial institutions' costs to participate in the Food Stamp Program, the advantages of an EBT system may well outweigh its additional costs.

Appendix A

FEASIBILITY OF A NATIONWIDE, OFF-LINE EBT SYSTEM

In examining the feasibility of implementing a nationwide EBT system, this report has focused on on-line EBT systems rather than off-line systems. Two factors explain this focus. First, on-line debit card technologies are much more mature than off-line technologies. Many commercial, on-line POS networks exist, and most EBT demonstrations are testing on-line EBT systems. Thus, the feasibility of near-term implementation of a nationwide, on-line EBT system is probably greater than for an off-line system. This is especially true if the EBT system is to be integrated with commercial POS systems. Second, as a result of the existence of commercial, on-line systems, considerable information exists for assessing the feasibility of a nationwide, on-line EBT system.

Despite the greater presence of on-line POS systems, off-line technologies do offer an alternative design approach for EBT systems. In addition to possibly storing information about recipient benefits in a central computer file, an off-line EBT system stores this information in the recipient's access card. As program benefits are used to purchase groceries, the card's data on remaining benefits are updated to reflect the decreased level of remaining benefits. As new benefits are authorized, the recipient takes his or her card to an issuance machine to have the benefits added to the remaining balance amount. System settlement occurs after the retailer's terminal transmits information about the day's total EBT sales to a central computer.

A prior study for FNS has explored several design options for an off-line EBT system and assessed their technical feasibility.[1] In addition, FNS is now sponsoring an off-line EBT demonstration which will use integrated chip cards (often called "smart" cards) as the system's access card. Neither the study nor the demonstration, however, addresses issues involved in

[1] Paul F.P. Coenen et al., The Feasibility of an Off-line Electronic Benefit Transfer System for the Food Stamp Program, Marietta, Georgia: Electronic Strategy Associates and Abt Associates Inc., September 1987.

establishing a nationwide EBT system using off-line technologies or a combination of on-line and off-line systems. This appendix, therefore, offers some preliminary thoughts on the feasibility of implementing a nationwide, off-line EBT system.

TECHNICAL FEASIBILITY OF A NATIONWIDE, OFF-LINE EBT SYSTEM

If the current off-line EBT demonstration shows that off-line EBT systems are technically feasibile on a small scale, it is almost certain that a large-scale system would be technically feasible as well. Unlike on-line EBT systems, system processing in an off-line system is much less sensitive to system size and transaction volumes. This results because a central processor is not needed to authorize EBT transactions in an on-line, real-time environment.

In an off-line EBT system, most system processing occurs at five points. First, the State or County Agency creates issuance authorization files that are transmitted to issuance machines. Second, the recipient takes his or her access card to the issuance machine. After verifying the recipient's identity, the machine updates the card's information on remaining benefits to reflect the new authorization. Third, the access card and the retailer's POS terminal interact to authorize each EBT purchase. Fourth, on a daily basis, information about each retailer's recent EBT sales is communicated to a central processor so that retailer settlement may occur. Finally, based on issuance authorization data and the information communicated from retailers' terminals, the central processor reconciles the system.

As the size of an off-line EBT system expands, most of the above processing is simply spread over a larger number of processing points (e.g., issuance machines, access cards and retailer terminals). Thus, if processing is technically feasible in a small system, it should remain feasible in a larger system. The two exceptions are retailer settlement and system reconciliation. As a system expands, settlement information must be gathered from more retailers and reconciliation will involve more transactions and accounts. Processing to support these functions is batch-oriented rather than on-line, however, and existing computer systems should be able to handle the batch processing requirements of settlement and reconciliation in a large system quite easily.

The major technical challenge in a large, off-line EBT system is the telecommunications software and hardware necessary to collect settlement and reconciliation data from retailers' terminals. The system design will require that a central processor collect data from each terminal in the system on a daily basis. If a central processing site were to handle settlement for a single, nationwide system (the centralized version of the Unitary Design approach to system development), the site's computers would have to collect information from about 557,200 terminals.

The difficulty of developing the necessary telecommunications support for retailer settlement depends, in part, on the amount of information collected from each terminal. As the amount of information increases, the time required to collect the information also increases. To reduce the total time required to collect the desired information, more communications lines to the central processor are needed. More communications lines, however, require more complex software and hardware.

To achieve retailer settlement, the minimum amount of information to be collected from each terminal is the terminal and retailer identification numbers and the net amount of EBT credits for the processing day. (In a multiprogram system, separate totals would be needed for each program.) Such a design, however, would not provide audit information for individual transactions. Thus, additional information is needed for each EBT transaction conducted at the terminal. This information includes the recipient's identification number, the type of transaction (i.e., purchase or refund), the transaction amount, the time and date of the transaction, and the program account used to pay for the purchase. Finally, if the system is designed to allow full reconciliation of recipients' remaining benefits, information on the recipient's remaining balance (for each program account) after each transaction also must be passed to the central processor.

To get a sense of the magnitude of the task of collecting the above information, consider that a nationwide EBT system would generate about 4.5 million food stamp transactions on days of peak activity. If each POS terminal used a 1200-baud modem, information on approximately two EBT trans-

actions could be transmitted to the central processor every second.[1] The total transmission time for 4.5 million transactions would be on the order of 625 hours. If five to six hours were allocated for receipt of settlement information (recognizing that a nationwide EBT system would encompass four time zones), the central processor would need to control somewhere between 100 and 125 communications lines. These lines would be used to collect information simultaneously from multiple retailer locations.

Telecommunications configurations using a central processor and 100 to 125 communications lines exist in the marketplace today, so the communications for a centralized off-line system should be technically feasible. As with an on-line system, however, multiple regional systems or State-level systems would be technically simpler to develop and perhaps more cost-effective.

TECHNICAL FEASIBILITY OF A MIXED ON-LINE/OFF-LINE SYSTEM

Although no empirical evidence yet exists, there is some belief that off-line EBT systems will be more cost-effective than on-line systems in rural areas, while on-line systems may be more cost-effective in urban areas. Lack of a low-cost telecommunications infrastructure in rural areas and the presence of commercial, on-line terminals in urban areas are two reasons given for the expected differences in cost-effectiveness.

One can imagine a nationwide EBT system that encompasses both on-line and off-line systems. With Federal approval, individual State or County Agencies could implement whichever basic system they thought most appropriate or cost-effective for their environment. States could even decide to implement an off-line system in some portions of the State and an on-line system in other portions, operating the two systems as two distinct issuance and redemption systems.

With the configuration envisioned above, it would be impossible for recipients participating in an off-line system to use their benefits to buy groceries at stores participating in the on-line system, and vice-versa. If

[1]This estimate is based on an assumption that the transaction message would contain between 50 and 75 characters of information and allows for some communication overhead time.

this is viewed as an important constraint, the real question of interest is whether it is possible to integrate on-line and off-line systems. That is, could participants in one system access their benefits at stores participating in the other system?

Although it is technically feasible to integrate on-line and off-line EBT systems, the resulting system offers few advantages over either a pure on-line or off-line system. As explained below, the system would represent two parallel systems operating in tandem, with expected costs exceeding those of either an on-line or off-line system.

Take as a first example a recipient participating in an off-line system. All program benefits reside on the recipient's access card. If the recipient wanted to shop at a store participating in an on-line system, that store's terminal would have to be capable of handling either an on-line or off-line transaction. Such terminals do exist, but they will be more expensive than regular on-line terminals because they must contain an extra card reader and additional programming. The only savings would be that the off-line transaction would not require on-line authorization. Offsetting this savings would be the extra cost of the terminal and the system's need to collect information on both on-line and off-line transactions to perform retailer settlement.

As a second example, consider an on-line system participant attempting to make a purchase in a store served by the off-line system. This could be accomplished only if the store's off-line terminal could read the magenetic stripe card and initiate an on-line transaction request. Again, this is technically feasible, but it would require a telecommunications link with the on-line processor and the same settlement complexity introduced in the first example.

Indeed, while the above examples speak of areas served by different systems, an integrated on-line/off-line system would really be a single system that could process either on-line or off-line transactions. All retailers would need terminals capable of reading either access card, and the system would need to be capable of settling both on-line and off-line transactions for all retailers. The only factors differentiating areas would be which type of access card had been issued and the relative mix of off-line and on-line transactions originating from that area's POS terminals.

MARKET FEASIBILITY

Perhaps the major factor affecting the feasibility of implementing a nationwide, off-line EBT system is the lack of market acceptance of off-line POS systems. The U.S. financial services industry has failed to adopt payment systems using off-line technologies. Although MasterCard and VISA have tested off-line systems in a few locations, they are not supporting further development at this time. Efforts to develop standards for smart card usage in financial payment systems also have been dropped due to lack of institutional interest.

Without support from financial institutions, widespread acceptance of an off-line EBT system at the retailer level may be very difficult. Retailers are likely to accept deployment of off-line POS terminals only if these terminals can be used for applications other than EBT. As discussed earlier, terminals supporting both off-line and on-line functions are available, but are more expensive than on-line terminals. Unless retailers and the financial services industry find a non-EBT market for off-line payment systems, it is difficult to envision a promising retailer acceptance of an off-line EBT system. The current off-line EBT demonstration, of course, could act as a catalyst for increased interest in non-EBT applications. If so, market conditions could change and improve the feasibility of implementing a nationwide, off-line EBT system.

DEVELOPMENT APPROACH

This report identifies three alternative approaches to development of a nationwide, on-line EBT system: the Multiple Design approach, the Standardized Design approach, and the Unitary Design approach. All three approaches are applicable to the development of an off-line EBT system, as described below.

In the Multiple Design approach, FNS would specify the functional and special program requirements for an off-line system. State or County Agencies (and their vendors) would have a great deal of flexibility to design the system to best meet local needs. As an example, the resulting systems could use smart cards, magnetic stripe cards, or other media to serve as the systems' access cards. It is likely that the resulting mix of system designs

across States would be greater than in an on-line system, because no standard commercial model exists for off-line POS systems.

If FNS wanted to ensure that recipients in one State could use another State's off-line system, each State's off-line system would have to adhere to some standardized design features. That is, each system would have to use the same type of access card technology, and information on the card would have to be formatted in a consistent manner. Retailer terminals would have to be similar to the extent that they would have to read information from the same type of access card. Unlike an on-line EBT system, however, message formats for transmitting retailer sales information to the State's vendor would not need to be identical, because these messages would not need to be transmitted between systems to obtain authorization. As in an on-line system, settlement of other States' recipients' transactions would require agreements among vendors on appropriate procedures for transfers of funds and transaction information.

Finally, Federal Agencies could decide to implement a Unitary EBT system based on off-line technologies. In this situation the vendor would maintain the necessary central files and processing support to settle retailer accounts and to reconcile all system accounts. Individual State and County Agencies would tie into the Unitary system if they wished to implement an EBT system.

The three development approaches could become more complex if a mixture of on-line and off-line EBT systems is envisioned. That is, the development approach selected for on-line EBT systems need not be the same as for off-line systems. For instance, FNS could specify standardized design parameters for on-line systems to ensure the availability of interchange and integration with commercial on-line systems. At the same time, fewer design restrictions could be placed on off-line systems, recognizing that few commercial standards exist for off-line POS systems. Similarly, FNS and other Federal Agencies could adopt the Unitary Design model for on-line EBT systems. Individual State or County Agencies could then tie into the Unitary system if they wanted an on-line EBT system, or they could develop their own off-line system.

ORGANIZATIONAL FEASIBILITY

If a nationwide EBT system is based entirely on off-line technologies, the organizational issues faced in implementing and operating the system are similar to those involved with an on-line system. As discussed in Chapter 3 of this report, these issues include coordination of effort among multiple Federal Agencies; changes in administrative tasks and responsibilities at the Federal, State and local levels; and changes in the administrative relationship between FNS and State or County Agencies in program operations. Of course, the differences between on-line and off-line system designs would change some of the specific organizational issues to be faced (e.g., how to organize card issuance activities at the local offices), but the general issues remain the same.

A nationwide EBT system which encompasses both on-line and off-line systems will pose greater organizational challenges at the State and Federal levels than a system which uses only one basic technology. Oversight of system operations will be more difficult because Federal and State officials will be dealing with two issuance systems, each with its own procedures for issuing access cards, authorizing benefits, settling retailer accounts, and reconciling benefit flows. In many respects the Federal and State Agencies' management responsibilities will be doubled as they monitor activities in both systems and then combine information from the two systems to compile total program statistics. To meet these management responsibilities, Federal and State Agencies may need to establish separate administrative units to monitor each system. Even if this is not necessary, administrative staff will have to follow different procedures to manage each system. For instance, separate reconciliation procedures will need to be followed for the on-line and off-line portions of the overall system.

SUMMARY

Given the lack of extensive experience with off-line debit card systems, it is difficult to assess the feasibility of implementing a nationwide, off-line EBT system. There is little reason to believe that a large-scale application would not be technically feasible, however, if the current off-line EBT demonstration shows that such systems are technically feasible on a small scale. The major technical challenge in a large system will be

developing the telecommunications infrastructure for collecting retailer settlement data.

With respect to the feasibility of implementing an EBT system that uses both on-line and off-line technologies, two options are available. First, on-line and off-line systems could be deployed in different areas. Second, an integrated on-line/off-line system could be designed and implemented. Both approaches are likely to be technically feasible.

A mixed on-line/off-line EBT system would not allow recipients from one system to access benefits at retailer locations served by the other system. If an off-line EBT system is more cost-effective than an on-line system in some locations, however, a mixed system could be more cost-effective than either a nationwide, on-line system or a nationwide, off-line system.

An integrated on-line/off-line system offers the advantage that recipients could access their benefits at any program-authorized store. Due to the increased costs associated with greater terminal functionality and more complex settlement and reconciliation procedures, an integrated on-line/off-line system would almost certainly be less cost-effective than either a nationwide, on-line or off-line system.

A major factor in the successful implementation of a nationwide, off-line EBT system is likely to be acceptance by retailers. Many retailers will not want to devote valuable counter space to an off-line POS terminal that serves only an EBT system, even if that system serves multiple assistance programs. Unless the retailer and financial services communities find marketable commercial uses for off-line POS terminals, many retailers are likely to resist implementation of an off-line EBT system.

Aside from technical and market issues, other factors affecting the feasibility of implementing a nationwide, off-line EBT system are similar to those for an on-line system. The same development options available for on-line systems exist for off-line systems. Federal, State and local agencies

Appendix B

SUPPLEMENTARY COST INFORMATION

In presenting the estimated costs to design, develop, implement and operate a nationwide EBT system, the report does not explicitly list the assumptions made about average monthly labor costs for personnel within Federal and State Agencies and local welfare offices. The exhibits in this appendix indicate these assumed costs. All monthly labor costs include salary, fringe benefits, administrative overhead, and non-labor indirect costs. The cost assumptions are based on data from the Reading and State-initiated EBT demonstrations and on monthly salary ranges for Federal employees with different service grades.

Exhibit B-1

AVERAGE FNS MONTHLY LABOR COSTS (PER PERSON) DURING SYSTEM DESIGN, DEVELOPMENT AND IMPLEMENTATION (Backup to Exhibit 8-1)

Task	Average Monthly Labor Cost[a]
Preparatory Costs	
Establish policy	$4,900
Rewrite regulations	$4,500
Manage Vendors	$4,900
Oversee State Activity	$4,500

Note: [a]Includes salary, fringe benefits, administrative overhead, and non-labor indirect costs.

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Exhibit B-2

AVERAGE STATE AGENCY MONTHLY LABOR COSTS (PER PERSON) DURING SYSTEM DESIGN, DEVELOPMENT AND IMPLEMENTATION (Backup to Exhibit B-2)

Position	Average Monthly Labor Cost[a]
Project Director	$4,800
Financial Management	$6,000
Contracts	$5,200
Program Heads	
Food Stamp	$6,000
AFDC	$6,000
Analyst	$3,000
Data Processing	
Lead Analyst	$5,400
Programmer	$2,400
Secretary	$2,400

Note: [a]Includes salary, fringe benefits, administrative overhead, and non-labor indirect costs

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Exhibit B-3

AVERAGE LOCAL OFFICE MONTHLY LABOR COSTS (PER PERSON) DURING SYSTEM DESIGN, DEVELOPMENT AND IMPLEMENTATION
(Backup to Exhibit 8-4)

Task	Average Monthly Labor Cost[a]
General Planning	$3,500
Encoding Clerk	$2,400
Trainers and Clerks	$2,800

Note: [a]Includes salary, fringe benefits, administrative overhead, and non-labor indirect costs.

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Exhibit B-4

AVERAGE STATE AGENCY MONTHLY LABOR COSTS (PER PERSON) DURING SYSTEM OPERATION
(Backup to Exhibit 8-10)

Position	Average Monthly Labor Cost[a]
Project Director	$4,800
Local Office Liaison	$3,500
Retailer/Vendor Liaison	$3,500
Programmer/Analyst	$4,800
Data Processing Clerk	$2,400
Secretary	$2,400

Note: [a]Includes salary, fringe benefits, administrative overhead, and non-labor indirect costs.

Appendix C

ALLOCATION OF SYSTEM OPERATING COSTS BETWEEN THE FOOD STAMP AND AFDC PROGRAMS

In a multiprogram EBT system, monthly operating costs must be allocated among the programs served by the system. Chapter 8 presented the estimated allocations for a system serving the Food Stamp and AFDC Programs. This appendix illustrates the method used in making the allocations, using the cost estimates for a State-Initiated system as an example.

Exhibit C-1 shows 18 cost components of a nationwide EBT system which sum to total monthly costs of $51,599,600--the high estimate for a State-Initiated system. In allocating these component costs to the two programs, we have allocated costs as much as possible on the basis of expected usage. The following five allocation rules were used:

- FSP - all component costs allocated to the Food Stamp Program.
- AFDC - all component costs allocated to the AFDC Program.
- Case - component costs allocated on the basis of the relative sizes of the respective caseloads.
- POS Trx - component costs allocated on the basis of the expected number of transactions generated by each program's recipients at POS terminals.
- All Trx - component costs allocated on the basis of the expected total number of POS and ATM transactions generated by each program's recipients.

Based on a national caseload of 7,054,773 food stamp cases and 3,771,000 AFDC cases, the "case" allocation rule assigns 70.8 percent of component costs to the Food Stamp Program. The "POS Trx" rule assigns 88.2 percent of component costs to the Food Stamp Program, based on expected averages of 8.0 food stamp POS transactions per case per month and 2.0 AFDC POS transactions per case per month. Finally, the "All Trx" rule assigns 78.9 percent of component costs to the Food Stamp Program, factoring in an expected average of 2.0 ATM transactions per AFDC case per month.

The rationale for most of the allocation rules used in Exhibit C-1 are evident. A few, however, deserve additonal comment.

"Other State Data Processing Costs" (Component 6) are allocated on the basis of all transactions because these costs cover State processing of system activity files, including system reconciliation. System activity levels and reconciliation are directly related to total transaction levels.

"State Telecommunications and Hardware Costs" (Component 7) are related mostly to program issuance authorizations and case maintenance. Thus, these costs are allocated on the basis of respective caseload size. The same is true for "Other Local Office Labor Costs" (Component 12).

"Recipient Hotline Costs" (Component 11) are expected to be related more to system usage than respective caseloads; they are therefore allocated on the basis of all transactions.

With the alloation rules in Exhibit C-1, total Food Stamp Program costs are $38,342,400 per month, or $5.43 per case month. Total AFDC costs are $13,257,200 per month, or $3.52 per case month. The same methods were used to allocate costs in all other approaches. The results are reported in Chapter 8.

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Exhibit C-1

ALLOCATION OF SYSTEM OPERATING COSTS FOR THE STATE-INITIATED SYSTEMS

Component	Total Cost	Allocation Rule	Food Stamp Portion	AFDC Portion
1. FNS Administrative Costs (Exhibit 8-8)	$973,500	FSP	$973,500	$0
2. FSA Administrative Costs (Exhibit 8-9)	$30,000	AFDC	$0	$30,000
3. State Labor Costs (Exhibit 8-10)	$1,261,400	Case	$893,100	$368,300
4. FSP Issuance Costs	$814,800	FSP	$814,800	$0
5. AFDC Issuance Costs	$622,200	AFDC	$0	$622,200
6. Other State Data Processing Costs	$1,457,500	All Trx	$1,150,000	$307,500
7. State Telecommunications Costs (Exhibit 8-11)	$75,800	Case	$53,700	$22,100
8. Client Training Costs	$2,382,200	Case	$1,686,600	$695,600
9. ATM Trainer Costs	$301,100	AFDC	$0	$301,100
10. Card Issuance Costs with PIN Selection (Exhibit 8-13)	$1,415,200	Case	$1,002,000	$413,200
11. Recipient Hotline Costs (Exhibit 8-13)	$3,351,100	All Trx	$2,644,000	$707,100
12. Other Local Office Labor Costs (Exhibit 8-13)	$2,174,500	Case	$1,539,500	$635,000
13. Terminal Costs (Exhibit 8-16)	$14,012,200	POS Trx	$12,358,800	$1,653,400
14. POS Transaction-based Fees (Exhibit 8-16)	$16,253,500	POS Trx	$14,335,600	$1,917,900

Exhibit C-1
(continued)

Component	Total Cost	Allocation Rule	Food Stamp Portion	AFDC Portion
15. ATM Transaction-based Fees (Exhibit 8-16)	$5,354,800	AFDC	$0	$5,354,800
16. Account-based Fees (Exhibit 8-16)	$465,500	Case	$329,600	$135,900
17. Manual Authorization (Exhibit 8-16)	$439,500	Pos Trx	$387,600	$51,900
18. Settlement Costs (Exhibit 8-16)	$214,800	All Trx	$169,500	$45,300
TOTAL COSTS	$51,599,600		$38,342,400	$13,257,200

Notes: Components 4-6 sum to the data processing costs presented in Exhibit 8-11.

Components 8 and 9 sum to the client training costs presented in Exhibit 8-13.

Appendix D

COUPON ISSUANCE AND REDEMPTION COSTS

Federal and State Agencies share the administrative costs of benefit issuance and redemption in the Food Stamp Program. As discussed below, the average monthly issuance and redemption cost in Fiscal Year 1988 was $3.00 per case, or $21.1 million per month for the entire caseload. The Federal share of this cost was $1.79 per case month, or $12.6 million per month.

State Agencies report their Food Stamp Program administrative costs on form SF-269. Cost categories include certification, issuance, fraud control, and data processing development and operations. For Fiscal Year 1988, total reported costs in the issuance category equaled an average of $1.79 per case month.

All local office caseworker costs are reported in the certification cost category. Some of these costs, however, represent caseworker time spent dealing with issuance-related matters (e.g., processing expedited issuances, handling recipient calls concerning lost or stolen issuance documents). Based on data from the Reading EBT demonstration, 2.55 percent of reported certification costs are issuance related. Applying this percentage to reported certification costs adds $0.38 per case month to estimated issuance costs, yielding a total of $2.17 per case month.

A portion of total reported fraud control and data processing operating costs also are incurred through tasks related to benefit issuance. Data processing costs, for instance, are incurred in generation of issuance authorization files, and State Agencies may investigate expected instances of fraudulent redemption of issuance documents. Lacking empirical data on the actual distribution of these costs between issuance and non-issuance tasks, we have allocated 13.1 percent of the reported costs to issuance. This percentage is based on the proportion of reported issuance and certification costs which is issuance related (i.e., $2.17 is 13.1 percent of $16.56, which is the sum of reported issuance and certification costs). The issuance-related portion of fraud control and data processing costs adds another $0.31 to per-case-month issuance costs, bringing the total to $2.48 per case month.

The final component of total issuance costs ($0.52 per case month) covers FNS' costs for coupon printing and distribution, coupon redemption through the Federal Reserve, managing retailer participation, and reconciliation and monitoring of the States' issuance systems. This cost estimate is based on interviews with FNS national and regional office staff.

Exhibit D-1 summarizes the individual components contributing to the estimate of $3.00 per case month for issuance- and redemption-related tasks in the Food Stamp Program.

The $3.00 per-case-month estimate represents an average cost for all 50 States, the District of Columbia, the Virgin Islands and Guam. Some sites have higher issuance costs than others. Using the same methodology for each site, per-case-month costs generally range from $1.19 to $6.70 (two sites with small caseloads have estimated costs of $13.97 and $18.68, respectively).[1] Twelve sites representing 19 percent of the total food stamp caseload have average costs exceeding $4.00 per case month. Ten sites representing 26 percent of the total caseload have average costs below $2.00 per case month.

[1]Using a more precise methodology for estimating costs, the evaluation of the Reading EBT demonstration estimated that administrative costs in the ATP/coupon system used in Berks County were $2.74 per case month. See John A. Kirlin et al., The Impacts of the State-Operated Electronic Benefit Transfer System in Reading, Pennsylvania, Cambridge, Massachusetts: Abt Associates Inc., February 1990, pp. 75-76.

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Exhibit D-1

COUPON ISSUANCE AND REDEMPTION COST COMPONENTS

Component	Cost Per Case Month	Source
State Administrative Costs		SF-269 Cost Reports
Issuance Category	$1.79	
Certification Category	$0.38	
Fraud Control and Data Processing Categories	$0.31	
Subtotal	$2.48	
FNS Administrative Costs		
Coupon Printing	$0.17	Interview, FNS Coupon Production and Supply Unit (CPSU)
Coupon Distribution	$0.02	Interview, FNS CPSU
Management of Coupon Printing and Distribution	$0.02	Interview, FNS CPSU and Mid-Atlantic Regional Office
Fees to Federal Reserve Banks	$0.16	Interview, FNS Accounting Division
Management of Retailer Participation	$0.13	Interviews with Multiple FNS Units[a]
Reconciling and Monitoring State Issuance Systems	$0.02	Interviews with Multiple FNS Units[a]
Subtotal	$0.52	
Total	$3.00	

Notes: [a]These estimates are based on Exhibits IIIB-7 and IIIB-9 in John A. Kirlin et al., The Impacts of the State-Operated Electronic Benefit Transfer System in Reading, Pennsylvania, Cambridge, Massachusetts: Abt Associates Inc., February 1990, pp. III-31 - III-33 and III-38 - III-40.